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NEWS SUMMARY

BUILDING OF COVENTRY CATHEDRAL began this week. *p.* 426

SIR GILES SCOTT, assessor in the architectural competition for Diocesan Church House, Liverpool, has made his award. *p.* 426

MR. CHUTER EDE, MP, speaking at the annual dinner of the Town Planning Institute last Friday, drew attention to the feeling of "apartness" of the new housing schemes built since the war, and the danger of creating one-class or one-income group communities on new estates and in the new towns. *p.* 428

A SURVEY OF TRADE OPPORTUNITIES in Central, East and South Africa is on *p.* 429

RESULTS OF A TRADE MISSION to Egypt, the Sudan and Abyssinia are reported on *p.* 432

OUTSPOKEN COMMENTS on the problems facing the building industry were made by Sir Thomas Bennett in a speech made in London. *p.* 443

DETAILS of a great development programme of power station building are given on *p.* 444

BUILDING IN AFRICA

NO continent holds more interest for the building industry at the present time than does Africa. Developments in economic and industrial and political fields have produced a situation where the constructor finds himself in the very centre of affairs, whether he is called on to house the new industries and the commerce they encourage, or to provide shelter for the millions of native African workers who are turning increasingly from tribal to industrial life.

The Union of South Africa, Rhodesia and British East Africa (which have been recently visited by a representative of *The Builder*) offer in their different ways much to interest the architect, the builder, the materials manufacturer and the skilled tradesman. Examples of recent buildings illustrated in following pages show that a standard of design is being established highly creditable to the profession. The best building and civil engineering contractors are very good indeed, and the older established firms of the Union are none the worse for finding themselves in competition with some of the more enterprising builders of the United Kingdom who, having cut their teeth on the admittedly difficult problem of African labour production, are now among the best in the country. The present position of the European artisan is good; he attracts an hourly rate of pay of about 10-12s. and even at that wage is in demand. Whether his future is as assured is more problematical, for the entry of the African native into the building crafts (something which at present is barred, except in Native areas) cannot—indeed, ought not to be long delayed. Yet there will remain indefinitely a need for the services of the European craftsman-supervisor who will teach the African to build well, a thing of which the latter is perfectly capable.

A contribution of another kind can be made by the producer and exporter of building plant and materials. The steadily increasing tempo of construction in the Union and in British Africa has been matched to some extent by the development of industries producing materials and plant for the building programme. In some of these directions South Africa is largely independent, but in others, and particularly in the fine things which go to the finishings of buildings, she must import, and we in Great Britain can make a contribution to her development by supplying materials and fittings.

Competition for her trade is keen in South Africa. It will become keener still if the Union's Import Controls are lifted, as it is confidently expected may shortly happen. The United Kingdom should stand to gain by any such move if exporters will gear themselves to the task of making a new assessment of the Union's markets. In the words of the Minister of State's message, printed overleaf, "a successful export policy can be pursued only if it is based on a real understanding of the conditions, tastes and needs of the overseas markets concerned." Sir Edward Twining, Governor of Tanganyika, has found it necessary to warn British exporters to that Territory that they are in danger of finding themselves ousted from the Tanganyika market by foreign competitiors who take more trouble with

The Rt. Hon. A. R. W. Low.

BUILDING IN AFRICA

A Message

from The Rt. Hon.
A. R. W. LOW, CBE, DSO, MP,
Minister of State,
The Board of Trade

IT is with great pleasure that I welcome this special issue of *The Builder* devoted to African questions. A recurrent theme in statements about exports, whether they are made by Ministers of the Crown or by the overseas agents of individual firms, is that a successful export policy can be pursued only if it is based on a real understanding of the conditions, tastes and needs of the overseas markets concerned.

In spite of the vast area of Africa and its relatively small population, the rapid rate of economic development and the drive to lift the standards of under-developed peoples make important demands on the building industry. Africa has a great future, and we in this country can make a valuable contribution to its development both by carrying out building projects and by supplying materials and fittings.

The Builder will help British industry to be alive to the possibilities and to the means of making the best of them.

I hope this issue of *The Builder* may set a fruitful precedent.

March 1, 1955.

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the potential customer and who provide better service. The warning is apposite should any think that "family connections" with the Union and with British Africa are sufficient in themselves to excuse higher prices and slacker service. Quality is not to-day the only selling point.

The Central African Federation is a more difficult proposition for the export of plant and materials, though not for entry into the building field. Long rail hauls and a natural need of economy by a tiny European community (only just over 200,000 for the whole Federation) combine to make it very necessary for imports to be bought in the cheapest market compatible with reasonable quality. And so, the bulk of building imports into Rhodesia come from the Union below her southern borders. Yet, the enormous potential of Rhodesia, which will be greatly added to by the Kariba hydro-electric scheme on the Zambesi and by improved railing from the coast, makes it very necessary that United Kingdom manufacturers should review the possibility of establishing branch factories in the Federation's area.

"Africa," as Mr. Low does well to remind us, "has a great future." No one who takes even the most casual look at Africa can fail to see that its future is irrevocably bound up with the future of its native peoples. A healthy, stabilised, trained and contented native population is not only a credit to the European element which fosters such condition; it offers the essential to any balanced industrial economy—a large and thriving home market. Not until the native population has improved its average production and so increased its earning capacity can this home market be developed.

How is this state of affairs to be brought about? How is the vicious circle of poverty, poor health, low production, and low wages to be broken? Undoubtedly by the creation of an increasing number of family homes for Africans so that the native worker can have his family around him. This, besides building up a stabilised industrial community, takes an effective step to breaking up the wasteful situation where the African maintains two homes, one in the city and the other on the Reservation. In this way also, by enabling the African worker to win a place in the sun for himself and his family, and to increase national productivity, European Africa can go far towards creating the Christian, common-sense idea of partnership of black and white on the basis of contribution and ability. This is not politics but sense and, provided the enthusiasts for a new Africa do not, by looking for an overnight transformation, drive the stubborn to fresh excesses, is the way things must go in Africa.

And so, by a curious turn of events, the building industry and its technicians find themselves at the heart of the African problem. Much is already being done for the African native, not least in the Union of South Africa, and it is the architects, the engineers and the builders who often are leading the way. These technicians manage somehow to evade the political miasma which envelopes the subject of African housing and welfare, but what they find hard to deal with is the lack of continuity of funds. The essential factor in African housing is to produce dwellings which the African can afford to rent or buy. A continuous building and research programme to find cheap suitable methods and materials are essential, but programmes and research become difficult if not impossible to organise when housing funds come through a tap which is turned on and off by the Treasury departments. British Africa is as badly served as any in this way, and might well take a lead in planning for, say, five-year programmes of African housing and welfare.

The British building industry is already helping in many parts of Africa in this essential work of housing. Much more needs doing; there is an insatiable demand for systems of cheap building, for materials which do the job adequately and cheaply; for firms which are prepared to put their specialised knowledge of organisation at the service of Africa; and not least, for tradesmen of the right kind to go out to Africa to teach the African to build. For housing and welfare are things on which the future of Africa may well depend; they must go forward with a strong, industrial programme of development so that the well-housed African finds a fairly paid job to his hand.

THE ARCHITECT IN AFRICA

Problems and Opportunities

By L. W. THORNTON WHITE, FRIBA (Professor in the School of Architecture, the University of Cape Town)

THE Africa of this article stretches from Cape Town to Mount Kenya and includes the Union of South Africa, the Federation of the Rhodesias and Nyasaland and the East African group of Kenya, Uganda and Tanganyika. It spills over into many adjoining territories, into SW Africa, the Protectorates within and outside the borders of the Union, into parts of the Congo and Portuguese East Africa and into many small islands off the coasts, of which Zanzibar is the most notable.

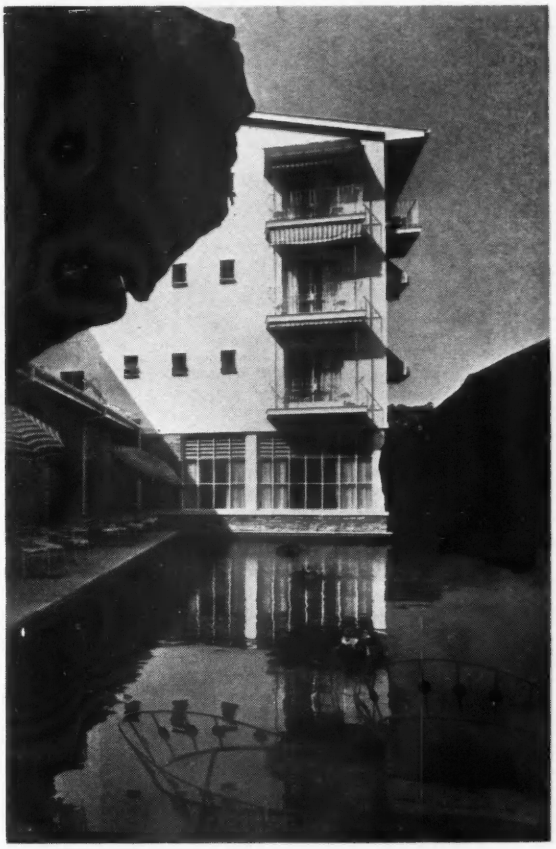
To the architect and planner, this vast area embraces more contrasting factors than can be found in perhaps any other part of the world. Human industry ranges, to give but one example, from the most primitive pursuit of game as the sole means of existence, or the tilling of the soil by methods which preceded the first impact of the invention of the wheel or the use of metal, to the most advanced and scientific organisations for the production of gold and uranium which the world yet possesses.

VIOLENT CONTRASTS

Human society adds incredible contrasts to our problems — more kinds of Africans (natives) speaking more basically different languages than can be found among, for example, the people of Europe; Europeans who still remember their childhood in one or other of all the countries of Europe or the Americas; an increasing number of white people who for some generations have known no home other than Africa; Arabs and Malays; Hindus, Moslems, Chinese and many other peoples recently and remotely from the East, and many peoples of mixed blood, notably the Cape Coloured of the Western Province of the Cape and the Swahili of East Africa, both now distinctive races.

The natural scene, too, has its violent contrasts. Altitude and latitude combine to produce perpetual snow on the equator in East Africa, watering bush and productive foothills and valleys, and at the other extreme perpetual waterless desert in great length and depth along the coast of SW Africa. Seasonal contrasts maintain this pattern, for in many of the more populated areas winter snow is followed by summer shade temperatures of well over 100 deg. F., while in other similar areas temperatures vary very little from one year's end to the other. Environmentally, Johannesburg and Nairobi, though some 2,000 miles apart, are closer together than Cape Town and Worcester, only 60 miles apart as the crow would fly.

It is against this challenging background of contrasts in both human society and natural scene that the architect and planner of to-day must work. It is difficult enough to arrive at satisfactory architectural answers to the variety of problems which arise, but it is even more difficult to state each problem in precise and accurate terms. As a result, the derivative architecture of the nineteenth century persisted rather deeply into the twentieth century, and indeed still does in many, but not all, official quarters. During the past 20 years, however, a large percentage of at least the European population has become conscious of architecture to a degree which is distinctly encouraging. During the past 10 years a high standard of living and much building society activity have, among other things, ensured an increased percentage of house owners, all increasingly aware of the architect's difficulties and proportionately appreciative of his successes. The remarkable expansion of industry, and particularly of secondary industry, housed in buildings designed to exacting legal standards of efficiency, safety and welfare, has introduced a large number of Europeans and a very large number of non-Europeans to the idea that architecture can play an important part in their enjoyment of life.



THE RIDGEWAY HOTEL, Lusaka. Geoffrey A. Jellicoe, FRIBA, Architect; Richard Costain, Ltd., Builders.

HOUSE for a doctor, Gwelo, S. Rhodesia. John Mercer, ARIBA, Architect.

ARCHITECTURAL HERITAGE

It is sometimes said that the architect in Africa is working without a local heritage of architectural history. This is undoubtedly true of some areas, but not of all the parts of Africa under review. The coastal regions of East Africa are rich in deserted cities, mostly associated with a natural harbour or creek, though the most famous, the so-called lost city of Gedi, lies a few miles inland. Further south and completely inland in the eastern uplands of S. Rhodesia are about 2,000 square miles of terraces, vast lengths of irrigation channels of complicated plan,

circular platforms and pits, tunnels and doorways, gates and fireplaces and forges, all awaiting study and explanation. Within the area is the abandoned city of some 50 square miles, known as the van Niekerk Ruins, now under investigation.

Still further south, the Zimbabwe and Khami Ruins, quite different in plan and technique, remain unexplained archæologically or architecturally. It is certain that other signs of earlier occupations will reveal themselves as the development of Africa continues. Today, the African continues to make his contribution in a variety of huts, rondavels and kraals.

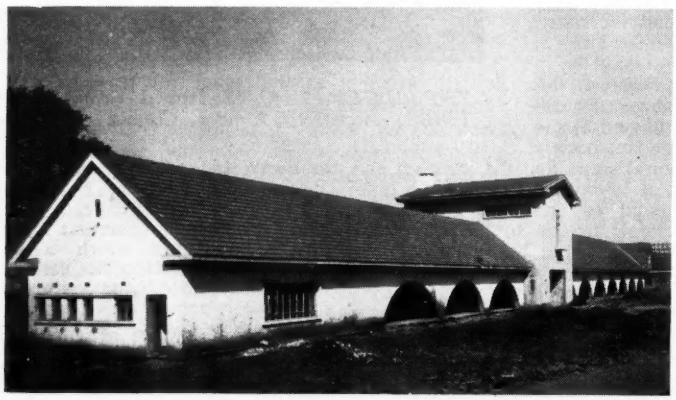
EUROPEAN CONTRIBUTIONS

Direct European contributions to architectural precedent in Africa commenced in the late fifteenth century with the Portuguese, who left many monuments to 200 years of rule on the East African coast of Kenya, but without solving many African problems. The early Dutch settlers were more successful and have left us the remarkable architecture of the many Cape-Dutch farms, two-storey town houses and various other buildings wherein local problems, as they then existed, were largely solved. Later the Englishman in South Africa, the German in Tanganyika and the Belgian in the Congo made notable contributions, particularly in the fields of plan design, orientation (which the Dutch largely ignored) and ventilation.

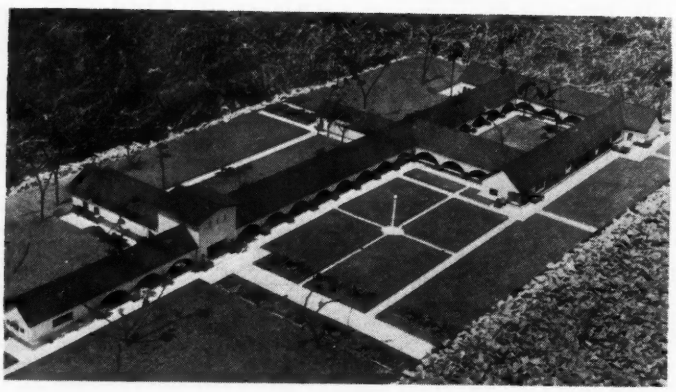
All these earlier works well repay study, not with any superficial idea of their reproduction or adaptation to present-day conditions, but with the deeper object of isolating the problems with which their builders were confronted.

METHODIST CHURCH, Lusaka, N. Rhodesia. Peter Lawson, DA (Edin), ARIBA, Architect.

The problem is the thing. Africa is becoming increasingly research-minded and the architect has available more and more basic facts resulting from surveys by scientific method. But these facts are not enough, and tend on the whole to be negative when applied to architectural problems. In the sociological field we have accurate statistics of what has been and very nearly is today, but these need projecting into the future not only in a mathematical sense but with imagination —for statistical facts based on an existing environment may be totally irrelevant in a new environment imaginatively produced by architects concentrated on some new solution to their own sincere interpretation of the human problem. Opinion based on some form of questionnaire or interview is not wholly reliable, for most people base their replies, of course, on the architecture they can see and live in, and can take no account of an architecture which they have not seen or lived in, nor can imagine.



JEAN RENNIE SCHOOL FOR GIRLS, part of the large secondary school for boys and girls at Kabulonga, Lusaka. A. Lloyd Spencer, FRIBA (Asst. Director (Buildings) PWD), Architect.



TEMPERATURE VARIATIONS

In the physical field there is even more research and fact available. Temperature, humidity, wind and rainfall records can give one a pretty accurate idea of comfort standards as they affect the human being, but can be very misleading indeed when applied to buildings themselves. For example, in many parts of South Africa, man may enjoy a Mediterranean climate for days on end, and with the shade temperature fluctuating comfortably over some 20 or 30 deg. F. But the actual temperature of, say, a metal flashing on the roof will rise by 100 to 120 deg. F. between sunrise and afternoon tea, and drop a similar amount before sunrise next morning. This extraordinary range may continue for many days.

It is true that in parts of Europe the actual surface temperatures of a building may vary by similar amounts throughout the year, but the gradual change from winter, through spring to summer and autumn allows the building to perform this expansion and contraction dance with slow and easy dignity, without ruffling a drip or raising an oriel. In some parts of our Africa, the building must go through the whole performance twice daily, its costume frequently suffering the indignity of a thunderstorm at the climax of its perspiring expansion.

The supply of materials and equipment constitute the other part of the problem and influences the solution. The Union

of South Africa is becoming increasingly self-contained so far as the basic materials are concerned — bricks, cement, steel, paints, hardwoods, etc.—but it still lacks a local supply of softwoods suitable for structural purposes. The supply of structural timber increases as one travels north to the equator, but the supply of other local basic materials fluctuates widely.

A similar position exists so far as fittings and building equipment are concerned—indeed, it is still true to say, even of the Union, that the finer items of equipment must be imported.

MATERIALS AND ECONOMICS

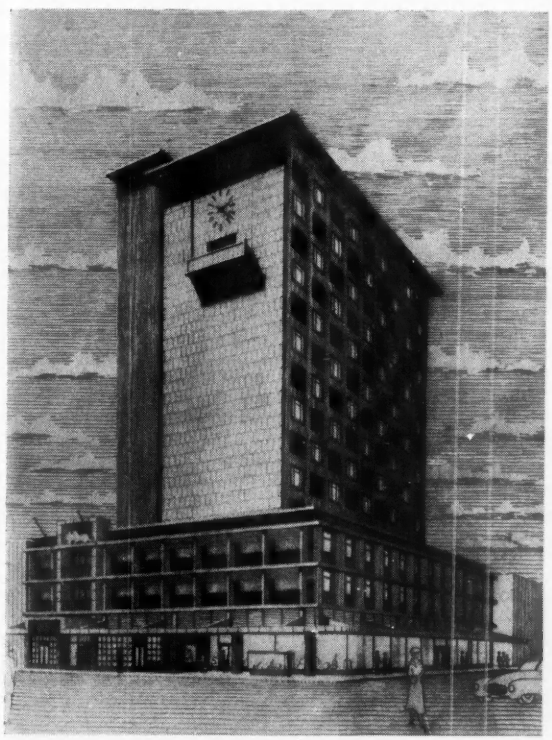
The economic factor plays an important part in the selection of materials and equipment, because the relative costs of various materials one to the other differs widely from ratios current in, say, Great Britain. Steel, for example, is relatively costly, while concrete is relatively cheap. Reinforced concrete, in a wide variety of forms, is therefore the almost universal choice as the basic structure, while a steel-framed building is the choice only under special circumstances. A boarded floor of one of the central African mahoganies can be cheaper than a floor of selected (and imported) deal. Lifts and air-conditioning plants, to mention only two items of equipment, are relatively costly in countries where their generous use would add so much to the comfort and efficiency of man.

AN ARCHITECTURAL CONTRIBUTION

A very large proportion of architects living and working in Africa are acutely aware of these conditions and factors. They are equally interested in the production of architecture which really solves our widely differing problems, not only in the purely functional use, but with a quality of design which in course of time will make an African contribution to the world evolution of architecture.

In the final analysis, however, the isolation of the practical, the technical and the social problems, and their reasonable solution, provide us only with a directive. The ultimate test is the visual character of our buildings. What are the aesthetic and spiritual problems involved in solving the architectural problems which Africa poses? We have on the one hand an astonishingly rich variety of natural scene and on the other the most complicated problems of human society. To the architect in Africa, the opportunity is great and the responsibility nothing less than invigorating.

HOUSE for a head of department, Bancroft Mine Township, N. Rhodesia, for Rhoanglo Mine Services. David Clark, ARIBA, Architect.



PREMISES for African Life Assurance Society, Ltd., Bulawayo. Ian Macgillivray, FRIBA, Architect.

RHOKOTAN HOUSE, Nairobi. Designed by Idris Davies, FRIBA (Wevill and Idris Davies).

THE *Construction Industry in South Africa*

NEED FOR OVERHAUL

By JAMES M. THOMPSON

Mr. James M. Thompson is managing director of James Thompson, Ltd., one of the oldest and most progressive firms of builders in the Union of South Africa. He is a past-president of the Association of Building Societies of South Africa.

TO describe the construction industry in the Union of South Africa in one article is well nigh impossible, and I shall only attempt a *pot pourri* of impressions and criticisms. As to whether the industry is in a vigorous active state, one has to know that this wide-spread country, the main towns hundreds of miles apart, has only a population of about 2½ million Whites and approximately an equivalent number of natives in or near the towns; the balance up to about 5½ million live in native reserves where any building done is of little consequence.

The towns and villages are, however, all experiencing great rebuilding conditions. Structures are rising everywhere which for design, quality, function and efficiency could bear comparison anywhere. One has, for instance, only to think of the towns of the Orange Free State goldfields. In 1947, this was a little-known, maize-growing part of the country served by poor roads and no railways, no water nor power within hundreds of miles; in 1955 there are modern, healthy towns enjoying every amenity, each housing at least 50,000 persons. This development is not isolated. Every part of the country can bear witness to striking change and growth. Industries, factories, new gold and coal mines, uranium plants, railways, highways, aerodromes: development goes on ceaselessly. One cannot pay tribute enough that so comparatively small a community accomplishes so much with such little bother.

AN ABIDING TRAGEDY

In the construction industry in South Africa there must be some 30,000 to 40,000 Whites employed, probably up to 100,000 natives as labourers, and well over £100 million worth of work is done annually. It is a never-ending source of surprise to me that with no real centralised controlling function nor authority the industry accomplishes as much as it does and as efficiently as it does. As one who has lived his life in building, it is an abiding tragedy to me that such a great industry, so vital to the country—with all its sub-trade specialist manufacturing and merchant ancillaries it could well claim to be the greatest—is really so little considered or known, and is itself broken up into so many totally separated and divergent pieces. So few seem to realise or understand that not one single function of man from the home to the factory, from the school to the hospital, from the church to the theatre, from the dams, docks, railway stations, power stations, roads, bridges, aerodromes to the 15-storey business blocks or the wood-panelled Prime Minister's office, can be performed without the planning, designing, labour and energy of the construction industry.

And yet never was any industry so feebly served, understood or appreciated. Not one of the Union's Government Ministries takes particular interest or could claim to understand or speak for the industry. The National Federation of Building Trade Employers in South Africa, the South African Federation of Civil Engineering Contractors, the Institute of South African Architects, the Chapter of SA Quantity Surveyors, the Institution of Civil Engineers, the Institution of Municipal Engineers, the Public Works, Irrigation, Transport and Defence Departments, the Provincial Administrations, the Chambers of Mines, Commerce and Industries, the Building Research Institute, the building trade unions, the technical colleges, and some universities, besides many others, have a stake and an interest in the construction industry, but very few of those have any common meeting grounds. Some of the above-named do, for specific purposes, confer or—shall we say—keep up diplomatic relations. The greatest cohesive force in its own particular but rather limited sphere is the Building Research Institute, run under the auspices of the Council for Scientific and Industrial

Mr. James M. Thompson.

OFFICE BLOCK, JOHANNESBURG, for Transvaal and Orange Free State Chamber of Mines. Architects: K. E. F. Gardiner and Macfadyen; consulting engineers: Reinforcing Steel Co. Ltd.; builders: James Thompson, Ltd.

Research and directed by an Advisory Committee, on which well-nigh every possible interest gives selfless service. The National Federation of Building Trade Employers, comprising, I think, about 16 Master Builder Associations throughout the Union and representing approximately 3,000 building trade employers, should with its various contacts and relationships with the architectural, surveying, Government and other bodies be the focal point of strength and interest, but it is here where there should be most unity that the schizophrenic tendencies of the industry appear most marked.

Master Builder Associations spend as much time and energy disciplining and controlling their members—which keeps many employers out of the associations—and bargaining with the Trade Unions as they do on larger and more important matters of policy and future development. The professions very guardedly meet and confer with employers on certain limited grounds such as contract conditions and standards of measurement, but a professional man would not know a Trade Unionist if he saw one. There is in South Africa a Joint Council for the industry comprised only of the building trade employers and the professional men, which constitutionally should be an excellent focal point for unity, but which operates at pedestrian pace on minor issues and gets bogged down due to the traditional warring viewpoints of the professions and trade employers, which viewpoints reflect the archaic outlook which most have on the industry they serve and on which they all depend for their livelihood.

DESIGN MUST MEET PRODUCTION

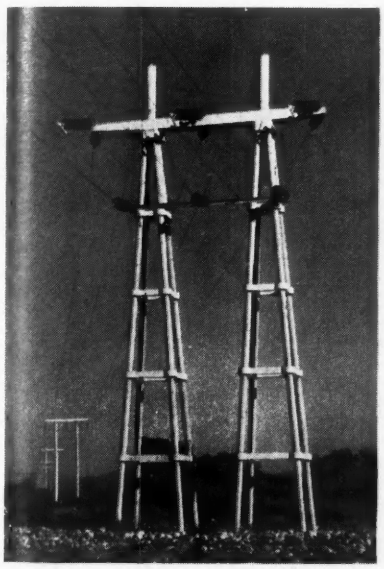
In this great complex and increasingly technical industry there is no longer any possible excuse for the design side, whether architect or engineer, to be exclusive and separate from the production side, above criticism and remote from the practical viewpoint. It would not be tolerated and does not exist in any other sphere of manufacture or construction. Imagine an aeroplane, ship, engine or car designed by one person and produced quite independently by another! Yet that is exactly how the great building public is served. Few modern architects, for all their academic knowledge, could build a building, and yet by nineteenth-century tradition and contract law they are placed in charge of the men that do build. Could anything be more ineffective? Many architects I know shirk or feel themselves unfitted for such responsibility. Only last week I heard a third-year student of architecture say to his father rather desperately — "But, Dad, when I am qualified, I could be the most wonderful architect in the world, but I would still have to go to the bricklayer and ask him to build what I plan."

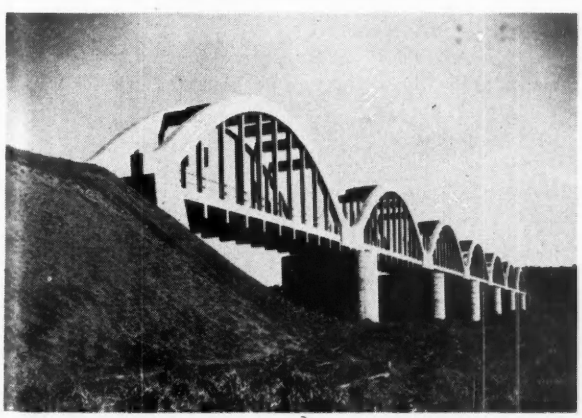
THE PRACTICAL ENGINEER

I must here add that this criticism does not apply so severely to the civil engineer whose whole training is more practical, and who is allowed to pass quite freely from the consultative to the contracting side of the business without stigma and loss of prestige, and enriches himself, the profession and the industry he serves thereby. It is hard to believe that in this mid-twentieth century an architect or quantity surveyor is not allowed to take office or get training in a contracting business without loss of status. It is this thwarting of the use of the best intelligence and intellectual capacities of men whose lives are devoted to the industry that reveals its greatest weakness for the future. I have said before and I say it now that when a man with architectural, surveying and engineering degrees, some obtained probably in an honorary manner, can sit in on and direct the affairs of a contracting company from the managing director's chair, then only will the industry be in a position to force the recognition it so deservedly warrants.

IMPROVING THE INDUSTRY

There is much to suggest that would improve the industry and there is naturally much to criticise. Existing contract conditions based on nineteenth-century practice are outmoded. They largely ignore the fact that there are two parties to the contract documents, and emphasise the responsibilities and duty of one—the contractor. More equitable contracting conditions setting up the rights, duties and responsibilities of both to each other and the contract, would greatly ease existing dissatisfactions and weaknesses. One finds that the professions, who are strongly placed as the owner's agents under present contract conditions, do not, however, welcome any change. In fact, experience shows that they strongly resist any introduction of clauses which will clarify and set down more clearly their duties and responsibilities to both parties. The position of sub-





Left: Power transmission line, ESC. Below: Bridge over Umhlatuzi river, Natal, by SA Railways and Harbours. Right: Standard Bank, Johannesburg. Architects: Stucke, Harrison, Ritchie and Watson; engineers: Reinforcing Steel Co. Ltd.; builders Lewis Construction Co.

THE NATIONAL BUILDING RESEARCH INSTITUTE, PRETORIA.
Architects: Berg, Lodge and Berg.

contractors needs clarification in most documents.

The training and education of men for management is another vital problem the possible solution of which is vitiated due to the exclusiveness of the professions, who quite naturally draw off many higher educated men who elect to enter the industry's ranks, thus leaving the production side of the industry deprived of much good and useful material. This means that it resorts, and has done so traditionally, to the men from the ranks, which brings results in many ways beneficial, but in many others exceedingly limiting.

THE QS NO COST EXPERT

I have mentioned the inadequacy of the existing architectural curricula for training men to organise and run complicated building projects. I must also mention the manner in which the control of the industry is falling more and more into the hands of the quantity surveyors who, excellent and honourable men as they are, must likewise be criticised for their very narrow and restricted outlook on the industry, which they must obtain by dint of their training. They certainly in many respects, by reason of their practical application of facts and figures, round off the impracticability of the aesthetic architect, but they likewise and with less excuse also hold themselves aloof from the production side. They claim to be the cost experts of the industry, whereas they know absolutely nothing about costs other than what they can gain from countless bills of quantities containing the priced items which they receive from contractors. No man who has not actually worked with the producer and knows the breakdown of cost, the use and waste of labour and material, on site overhead and profit factors, can pretend to have any knowledge of costs at all, and yet the quantity surveyor claims to be virtually the one and only being in the industry who knows anything about them.

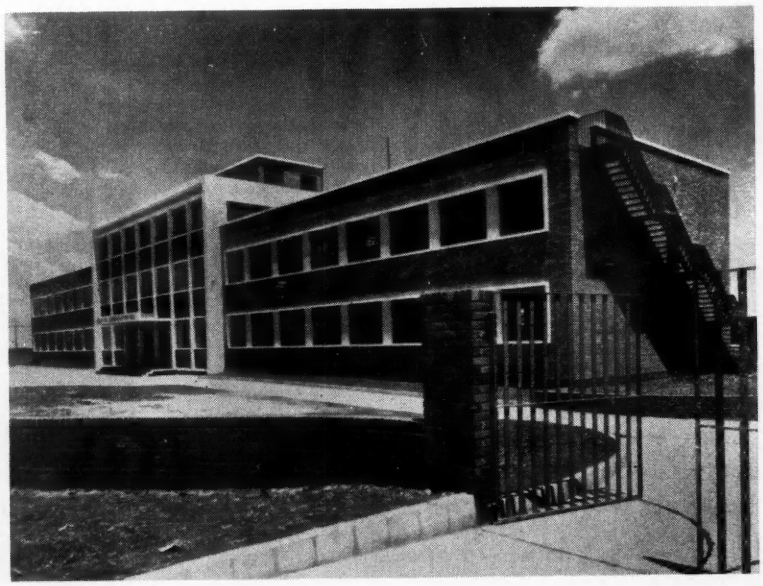
What the quantity surveyor forgets is that he deals with the sales figures presented to him by various contractors who price bills, and not the cost figures, and he knows little, and if possible cares even less regarding the financial and economic implications of producing a building. If part of his training were to go into a contractor's office and realise how essential it is to make money work to earn this profit in competitive conditions, he would be a far more useful, sympathetic and understanding man to the industry as a whole, including his client. It is noticeable how in recent years he is even encroaching on the civil engineering industry, where the tight pattern of standard measurement, which the quantity surveyor worships as his god, is even less practicable and effective, but which owners are being persuaded more and more to use.

THE TRADE UNIONS

The industry suffers from a grave over-employment problem partly due, as mentioned above, to the difficulty of attracting sufficient higher educated men to it for management requirements, and to such seekers there is a seeming lack of opportunity and no clear path to follow. This is aggravated in South Africa by the fact that the native worker who forms the bulk of the population cannot be used for skilled work except for his own requirements in his own areas as provided for recently in the Native Building Workers Act. This position is in itself untenable, as the industry is traditionally a craft industry, whereas the whole modern tendency of the industry as with other industries is to organise and produce on an operative basis. The White trade unions continue to defend to the last ditch their position as protectors of the skilled White craftsmen, and are keeping their ranks closed at a time when they are unable to produce enough or more workers of the craft standard. It is obvious to all but them that more and more of the work must ultimately be done by operative semi-trained or semi-skilled men who, incidentally, ultimately need not necessarily be White. This is a major problem, which sooner or later must be faced, and it would be better if it were faced by a united industry rather than one weakened by divergence and clashing interests.

THE INDUSTRY'S ILLNESS

I must also mention the pinning of the whole industry, mainly at the instance of the professions, to competitive tendering. I am not against competition in itself, which I agree is a good and healthy thing, but in the building industry it is carried to such extremes and to the complete exclusion of all other worth-while elements (such as quality, speed of building and the employment of the most fitted persons to perform certain kinds of work) that it is in my opinion one of the greatest illnesses of the industry. It keeps the industry poor and does not, I feel, really give the building owner all the great economies that it is claimed it



FACTORY for Glaxo Laboratories, Wadeville, Transvaal. Builders: John Laing and Son, Ltd.

does. It certainly keeps many building trade employers near the insolvency mark, and an industry which is dependent on many small, weak units, ruthlessly battling with each other, and with all men's hands against them, cannot be considered sound and secure. It is a pity that the intelligentsia of the industry (and by these I mean the professions) do not realise that by insisting on ruthless competition they are not always serving their clients' interest best. In any case, I claim that competition is frequently a misnomer, as large portions of any bill of quantities are handed out to specialists, without competition; the specification of the same materials and the use of the same labour at the same cost by 20 odd tenderers for a project really brings the only competitive element in the whole work down to the contractor's overhead and profit, which is at the outside most usually not more than about 10 per cent. of the whole bill. Likewise an industry which builds up no financial reserves can conduct no research, cannot develop and cast ahead for new ideas and methods as it should. I am quite certain that the time wasted in calling for competition frequently results in more loss of interest on the money involved in the project than any saving acquired through cut-rate prices from the bottom tenderers, who quite often are making a contribution to the cost of the building and somehow or other take it out in some other form to the owner's detriment.

A FORUM NEEDED

These items I have named above are the main weakening factors. Each and every one deserves the fullest debate, knowledge and guidance on policy by all interested parties who serve the industry. It is quite impossible under the present set-up, however, to obtain this, and that, I repeat, is the greatest tragedy of all. There is no main platform, no main meeting place at which divergent views, which are frequently founded on ignorance of any viewpoint other than one's own, could be thrashed out and settled. The industry would be stronger for such a platform and would thereby in the long run give better service to the public.

It would appear that such an effort from the South African industry itself, which is at the moment spread-eagled into numbers of self-contained, self-interested groups, is impossible. Probably in this age of all-powerful government such leadership and guidance should and must come from Government itself, sad as such an admission makes one.

The industry to me at the moment is rather like a Gulliver who must be loosed from his bonds—the bonds created and held tight by many little men.

THE NATIONAL BANK OF INDIA, KAMPALA. This building, opened in May last, was designed by Messrs. Cobb and Powell, and built by Booth & Co. (Africa) Ltd., who are associated with the Unit Construction Co. Ltd. It is one of a number of new commercial buildings in Uganda.

THE TREASURY, NAIROBI. Designed by PWD Architects.

CENTRAL AFRICAN POWER

Kariba Scheme Chosen

THE Central African Federation Government has decided to proceed with the Kariba hydroelectric project on the Zambezi River. The scheme, which is estimated to cost £54m., is expected to be in operation by 1961.

Giving this information to the Federal Parliament on March 1, Sir Godfrey Huggins, the Prime Minister, said that the decision to prefer the Kariba scheme to the plan to harness the Kafue River in Northern Rhodesia was based on a consideration of all factors, not least that the Kafue project, while capable of being brought into operation two years earlier than Kariba, would be inadequate before 1963, and even with the second stage would be too small by 1964. One of the big advantages of the Kariba scheme would be that after the dam was built the output of power could be increased merely by the addition of more generating sets.

The construction of the installations will involve building about 90 miles of railway line northwards from Sinoia in Southern Rhodesia, and the resettlement of Africans now living in that part of the Zambezi valley to be inundated.

The scheme includes a dam across the Zambezi nearly 400 ft. high and with a crest length of 1,850 ft., constructed in the Kariba Gorge. The water brought under control will form a lake upwards of 150 miles long. Though, as stated, £54m. is the cost of the first stage, which will include the dam itself, the final cost has been estimated at nearly £86m.

Now that the decision is taken, the Federal Government intend to press on with all speed so that preliminary work is ready to be undertaken as soon as the rains end.

G

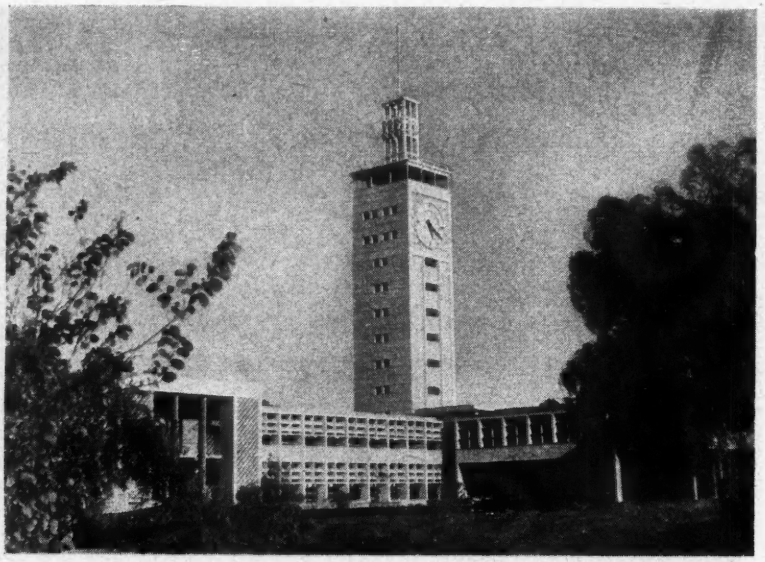
Three Buildings, Nairobi

THE three buildings illustrated on this page are all sited in the City Square area of Nairobi, where development is strictly controlled. The first is the new Parliament (or Legco) Building, opened just over a year ago. The clock tower is a dominating feature of the design, which is by H. Thornley Dyer, FRIBA (Planning Officer to the Government of Kenya) and Amyas D. Connell, ARIBA.

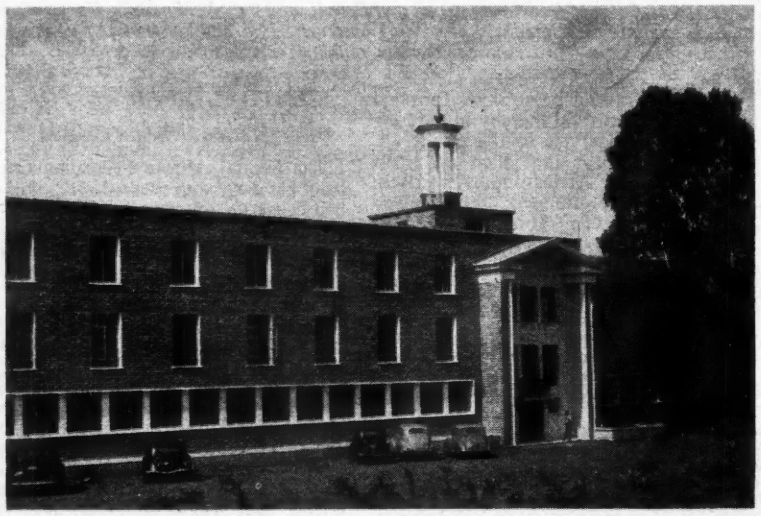
The County Hall, shown in the middle, faces the Legco Building at the southern end of the Princess Elizabeth Way. Materials are a pleasant local brick with reconstructed stone, the end walls being built in a local blue-grey stone which marries in well with the brickwork. The architects are Jackson and Hill.

Below is shown the design of Hughes and Polkinghorne, MBE, F/ARIBA, for the development of Plot D in the City Square development. The building will provide shops, offices and showrooms. There will be two floors of shops, to be let individually, the upper floor approached by an elevated pavement, though shops may be let as double-storey. The rear half of the double-storey divides into three floors by the use of a mezzanine. All floors have service access to the loading yard. Over the shops are three floors of offices and a caretaker's flat and lift room at sixth storey.

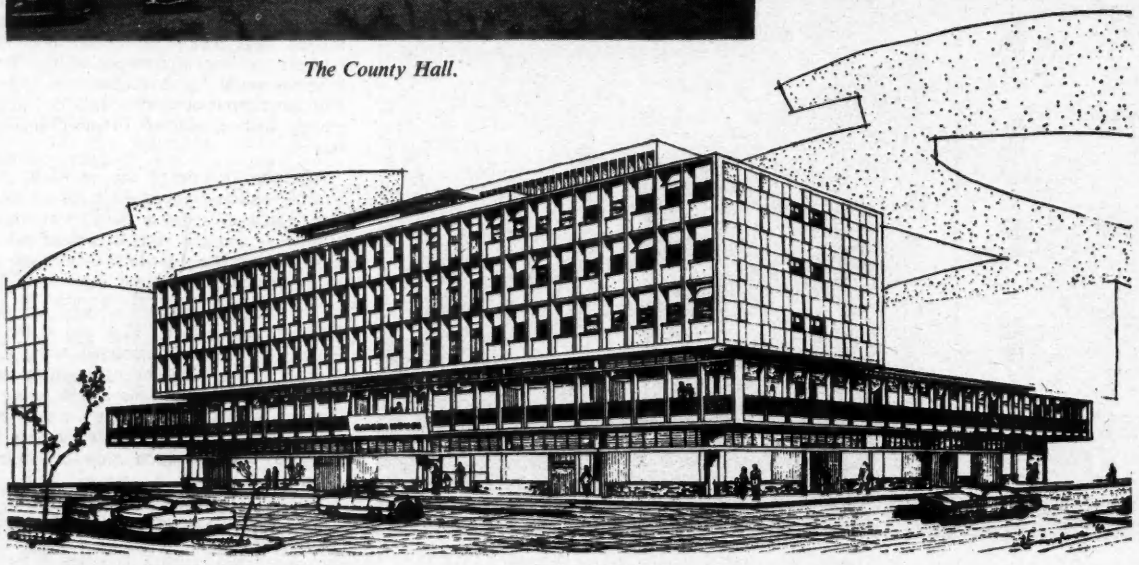
The east flank of the building is owner-occupied by the Car and General Equipment Co., Ltd. The brise-soleil *is structural, supporting all floor slabs. The north and south windowed elevations are infilled with awning-type windows and pressed metal enamel panels. The concrete frame is fair-faced white cement mix, and the end flank filling is precast rough terrazzo coloured slab. Shop fronts are a mixture of glass adjoining untreated cedar and multi-coloured stone.*



The Parliament (Legco) Building.



The County Hall.



Store and Office Building, City Square.

"Albany House" Durban, Natal

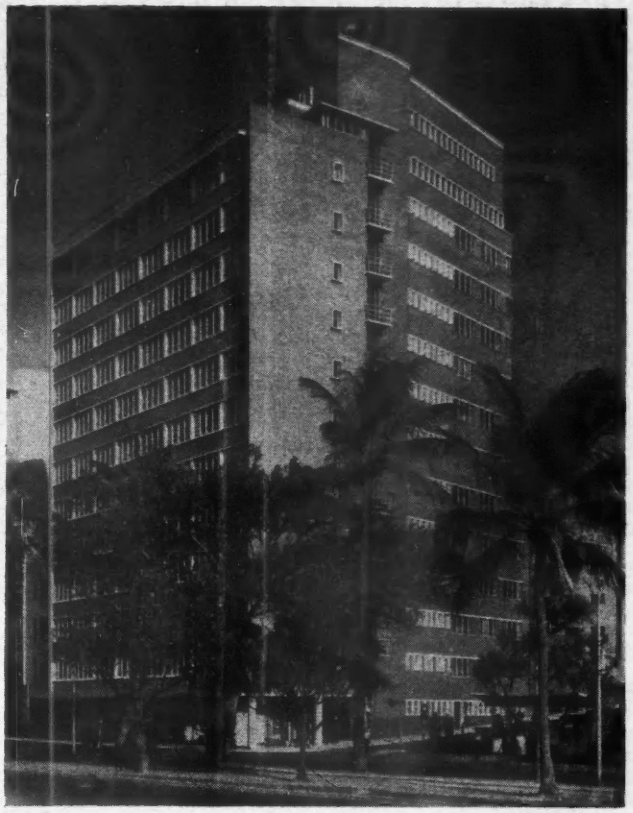
PATON, TAYLOR & PARTNERS, F/AA.RIBA, MM.IA, Architects

Quantity Surveyor
WALTERS & SIMPSON

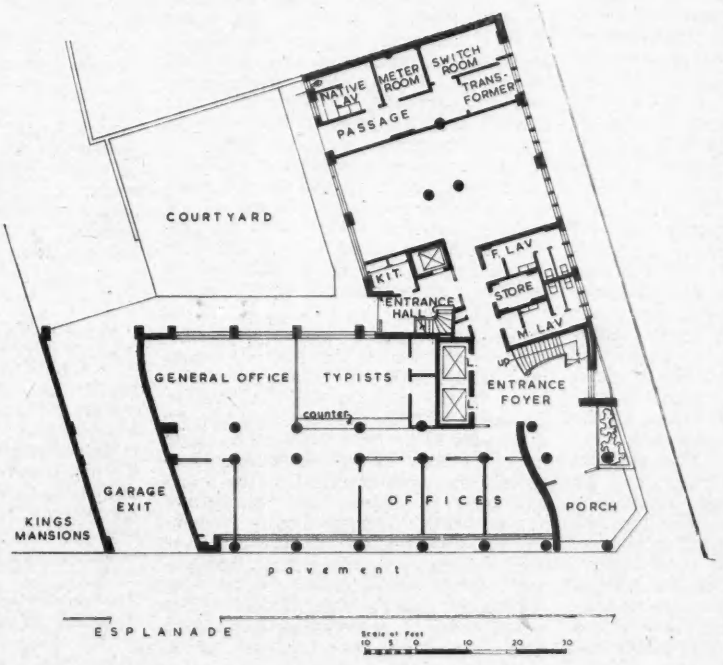
Builders
ROBERTS CONSTRUCTION CO., LTD.

THIS block of offices occupies a site with frontage of 112 ft. to Durban Esplanade, with a return of 175 ft. to Albany-grove. The Esplanade end has been developed to the full economic height under the by-laws (12 floors of offices and two service floors). Two wings of offices ensure optimum lighting, access being given from a central core of public space which also houses two 15-passenger high-speed lifts, the main stair, lavatories and tea kitchens (one to each floor). Vertical circulation for native servants is given by a separate staircase.

CONSTRUCTION: *The r.c. frame is infilled with 2-in. bronze bricks, panels between windows on the Esplanade front being in blue-brown brick. Cills and window heads are in ivory terrazzo. Column spacing is at 12 ft. 7 in. centres along the street fronts, allowing four windows between columns. Internal columns are octagonal, for easy junction. The building is founded on Vibro piles, floors being hollow tile. Special attention has been given to air-conditioning. The cost, inclusive of fees, was £222,800.*



View from Esplanade. Below: Ground-floor plan.



HOUSING FOR THE BANTU

An Outline of Development

[*By Our Own Correspondent*]

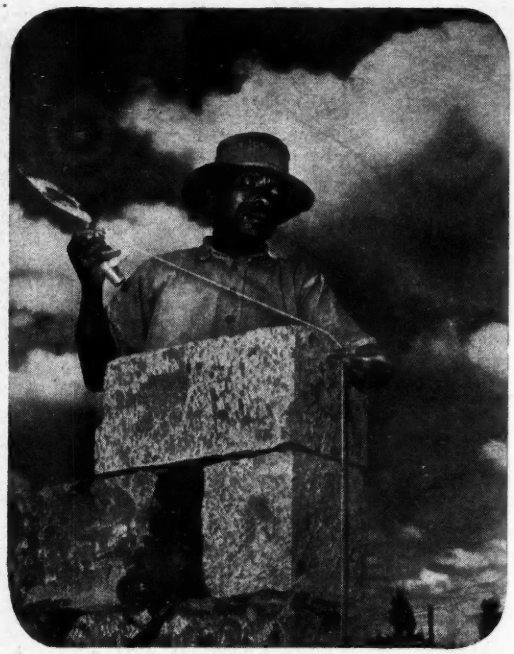
1.—*Union of South Africa*

THE economic structure of Africa to-day, founded as it is on European technical ability and capital, serviced by native African labour, has created a continent-deep demand for the man-power of the African races, and a need (not apparent a century ago) to house them.

The problems involved in housing the Bantu (native) people of South Africa are probably unique. To quote Professor J. E. B. Jennings (until recently Director of the National Building Research Institute, Pretoria): "they arise partly as a result of the industrial revolution which has taken place, and partly because of an associated social revolution which has resulted from the disruption of an older tribal form of life, based mainly on a pastoral economy with frequent inter-tribal wars. . . . The Bantu peoples have been forced to live in peace under conditions which have progressively approached nearer and nearer to western standards of hygiene and medicine. The influences of changes such as these on a primitive population are to cause a sudden increase in the rate of growth of the population and compel the search for other standards with which to replace tribal standards. The great increase in numbers, and the pressing claims of the indigenous people of this continent to adopt the western way of life, in which the family replaces the tribe as the basic unit in the community, thus find their cause in the social upheaval which has taken place in the last 100 years."* Though political developments have tended to concentrate world attention on the native housing problem in the Union of South Africa, the background given by Jennings is true of the greater part of Africa.

Possibly because his home is such an integral part of man's life, it is difficult to keep housing out of politics. We in the United Kingdom have not succeeded in this, nor has Africa, and particularly the Union. But in Africa the political difficulties are complicated by the problem of colour, a problem which has its roots not so much in technical difficulties as in the mental processes of fear—fear of miscegenation, fear of being eventually overwhelmed by sheer weight of numbers, by a dark Frankenstein whom world public opinion, from a safe distance, is urging South Africa, as the latter sees it, through education and opportunity, to create. This problem immensely adds to the difficulties of the technician in sorting out a situation already made sufficiently difficult by the general inability of the Bantu to allocate anything much, if anything at all, to rent. As Jennings puts it: "Further complications in our society are the fully justifiable aim of the industrialist to work for profit; the practice of paying labour the minimum consistent with the law of supply and demand rather than with the cost of living; and the general low productivity of a people without an industrial tradition of skills which, in itself, automatically keeps wages at a low level." It is to this broad, human problem that Jennings believes must be brought a "whole engineering approach" in which sociologists, architects, engineers, psychologists, physiologists, quantity surveyors, lawyers, chemists, physicists, builders, craftsmen and administrators shall team together.

It is perhaps the brightest feature of the South African political scene as it affects the Bantu that the technicians who make up what Jennings calls "the whole engineering approach" are far ahead of public and political opinion in their appreciation of the fact that the Bantu needs all the help that can be given him, and that in helping him willingly and to the fullest extent of resources available, some store of good will is being established on which the future may be glad to draw.



Copyright: East African Railways and Harbours.

Karanja, a Kikuyu artisan at work.

EXTENT OF PROBLEM

The extent of the problem faced by the Union of South Africa is that to-day there is a shortage of approximately 167,000 dwelling units for the urban Bantu. The next 10 years will require an additional number of units estimated at 185,000. Together these figures mean that approximately 350,000 units are needed over the next 10 years — an annual programme over the period of 35,000 houses. At present local authority building is providing about 5,000 units annually, and the Bantu themselves are building a further 4,500 units. To provide 35,000 houses per annum means in round figures that the present rate of building must be increased by four times.

These figures take no account of the contribution made by industry, particularly by the mines, but there are signs that good housing of employees is also being viewed as good business practice. Examples of good industrial practice are to be seen at the new Orange Free State mines at Welcom and elsewhere. Previously the main objective of the mines has been to house the "bachelor" native worker whose family remain on his smallholding on the Reservation, and this policy is general throughout the old-established mines at Kimberley and on the Rand. The wastefulness of perpetuating a situation where the Bantu thus has two homes, yet feels settled in neither, is now being recognised as being uneconomic as well as giving rise to a number of evils which may be expected when men lead a bachelor existence in compounds.

In fact, a number of economic reasons are beginning to reinforce the Christian belief that it is wrong to split the family, and industry now is holding increasingly to the view that what is needed is a stabilised African urban community in every industrial centre, i.e., a native community who have elected to make the town their home and industry their livelihood. Not least among these economic reasons is the fact that when an African, after a spell in, say, the mines followed by a period back on the Reservation, returns to his work, he has usually to be trained again from the very beginning. Stabilisation also enables the introduction of such benefits as holidays and pension which act as an incentive to improved output. It has been shown that labour turnover is reduced by over half if employees are properly housed.

A VICIOUS CIRCLE

In any consideration of the native housing question in the Union of South Africa it is to be noticed that the proportion of European population to native, coloured and Asiatic is roughly of the order of two millions to eleven millions, and that the vast majority of the non-Europeans earn wages which do not enable them to set aside anything like an economic rent; in many cases, indeed, they can afford nothing for rent at all. In addition, due to the effect of a number

* Housing for the Urban Bantu—a Problem in Whole Engineering (1954). South African Council for Scientific and Industrial Research, Pretoria, South Africa. Price 6d.

† The African Mind in Sickness and Health. By J. C. Carothers. (London: HM Stationery Office.) Price 10s.

of reasons, the native suffers from chronic poor health which Carothers† on average puts at a perpetual 30 per cent. below par. A circle of events is thus set up, bad housing, poor health, malnutrition, poor staying power, low production, and low wages which combine to prevent him from raising his standard of living and his housing conditions.

If the general physical condition of the Bantu is to be improved (and improved it must be both for his own sake and for the industrial future of Africa) this vicious circle must be broken, and broken at the point where stabilisation can best be induced — housing. And, pending the arrival of the time when the African worker is paid (and merits) a wage which will enable him to make a substantial contribution towards his housing, the burden of housing the African must continue to fall upon the European. It is thus easy to see how housing for the African becomes linked with politics and with the racial question.

CENTRAL CONTROL OF FUNDS

A situation already complicated is made more so in that control of the Union's housing programmes is in central government hands by virtue of the fact that the Union Treasury annually allocates funds for native housing. Mr. Case Bakker, President of the National Federation of Building Trades Employers in South Africa, drew attention to some of the drawbacks of the system in an address to the recent Golden Jubilee Congress of the Federation held in Durban. Mr. Bakker said:

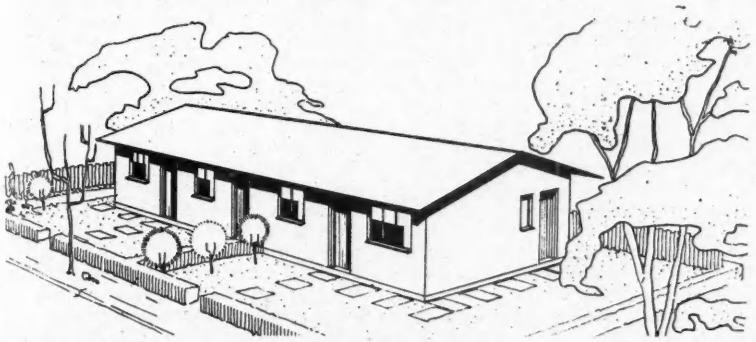
"Every housing authority has suffered from unnecessary delays and opposition from unexpected quarters. Schemes have to be designed to the last detail and then submitted to the Housing and Planning Commission and when approved returned to the local authority via the Provincial Administration, and even then a start cannot be made as one has to wait for the allocation of funds. Before the latter are made available, the whole scheme may be upset by fluctuating costs."

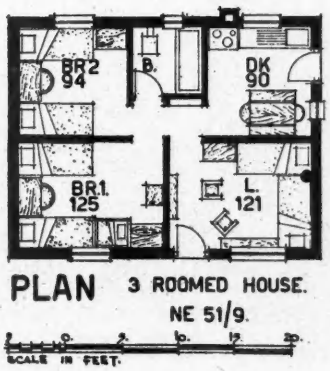
Later in the same address Mr. Bakker touched upon a further matter of difficulty to the housing authority which is met with not in the Union only, but in other parts of Africa also — notably Uganda and Kenya. Said Mr. Bakker:

"Perhaps the biggest difficulty exists because of the inability of the Union Treasury to state in advance of a Government financial year just what its allocation will be for that year. Allocations are made at what seems to be a very late date in the year so that local authorities have to waste unnecessary time awaiting funds. In addition, unspent allocations may not be carried forward to the next financial year but must fall away at the end of the Government year. . . .

"Large-scale developments such as housing require a far more flexible system of financing—one which allows of broad planning and continuity of funds and action, which would avoid the present narrow confining into rigid limits and the mad scramble which sometimes takes place to enable allocations to be used in the time left.

"Our standards are getting lower and lower; a man's earnings determine the thickness of the walls of his shelter, and our country will soon be covered with dwellings of monotonous similarity without distinction or soul."





NE 51/9 HOUSE FOR NATIVES. This design, produced by the National Building Research Institute at Pretoria, is the standard type plan for the 4-room house. It has been used with or without adaptation for many parts of Africa. Walls are of brick or concrete, usually 4 in. thick, unplastered. Roofs are covered with asbestos cement sheet, carried on 4½-in. by 3-in. purlins, with a 4-ft. crank at the ridge. Dining-kitchen and bath space only are concreted, the other floors being rammed earth.

LONG-TERM PROGRAMMES NEEDED

Mr. Bakker, who is not only a practical builder but a member of the Cape Town City Council and of its Native Housing Committee, almost certainly interprets here the opinion of every Housing Committee and technician engaged on this work. Indeed, many would go farther and claim that nothing less than a five-year programme of work with guaranteed funds can enable the planning and technical research necessary to achieve rapid construction and low costs. It is certain that many authorities work under handicap. Moreover, this division of responsibility between central and local authority enables a slack authority to do less than it should and to rest on an alibi of interference by central authority. Is it not time that South Africa (not the Union only) should give consideration to the British system by which responsibility for meeting local housing needs is placed squarely on the shoulders of each local authority, the Government giving such financial and other help as is required to bring the housing within the reach of those for whom it is intended? Until such consideration is given, subeconomic housing will remain the plaything of political interests.

RESEARCH INTO HOUSING

Such criticisms of South African housing policy as have been made arise out of the political background. They do not apply to work done in the research and scientific fields where the best brains in the scientific and building worlds have for the past seven years been engaged in finding solutions to the problems of low-cost native housing. As Jennings has put it: "The research problem involves, firstly, the attempt to understand the needs of people in their houses and communities, and secondly, the planning of buildings and towns around these needs. The problem becomes one of measuring man's requirements and finding how they can best be provided within the means at his disposal." Detailed studies have been made of the housing problems in the Union in relation to existing legislation, the social trends in housing, the attitudes of occupants, the effects of heat and cold in dwellings, natural and artificial illumination, noise, the planning of estates and, finally, the planning of the dwelling itself.

The basic requirements, as isolated by a research team headed by Jennings at the National Building Research Institute (NBRI), are:

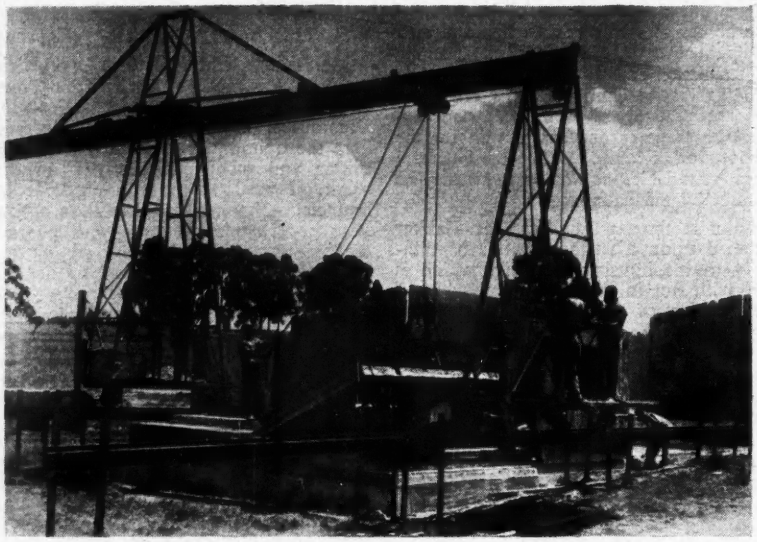
(a) The housing must be such as to allow the proper functioning of family life within the community;

(b) It must safeguard the health of the occupants;

(c) It must be sufficiently economical to be within the means of the people to be housed; and

(d) It must be sufficiently durable to justify the investment of public funds.

These requirements have formed the background for an investigation into the impact of research on the costs of native housing on the building industry, carried



NATIVE HOUSES under construction, Transvaal, on the Robconco slab system. (*Laing and Roberts (Pty.), Ltd.*)

out by the NBRI under the auspices of the Council for Scientific and Industrial Research and sponsored by the National Housing and Planning Commission, and a summary of the findings was given by Mr. T. H. Louw, BSc, MCQS, ARICS, its chairman, to the builders' Durban Congress.

The Committee finds that in the planning of townships, four classes of housing should be provided and that, subject to the observance of minimum standards of housing, the four classes should be:

(1) SUPERIOR HOUSING for ownership by the occupant. Much of this, it is thought, will be provided by the Bantu population themselves with their own contracting and financing arrangements, on sites serviced after the pattern of European developments and under rigid control;

(2) GOOD-CLASS HOUSING for rental purposes. The construction and finish of these should range from the lower "superior class" given above to the upper "lower-class" described below.

(3) LOWER-CLASS HOUSING in which the rental is partly subsidised. This class might have space for bathing but no proper bathroom. Floors should be of earth except kitchens, passages and lavatories which should be concreted. No ceilings, and houses arranged as semi-detached.

(4) MINIMUM CLASS HOUSING in which the rental should be subsidised to a greater extent. In this class the object is to provide shelter without injury to health or to family life. Consistent with the minimum standards of accommodation and the need to safeguard the asset of the building, the structure should be cut to give a minimum cost. Earth floors in all rooms except kitchen and lavatory; no ceilings; buildings to be planned in terraces; wall thicknesses should be reduced to a minimum (this means in effect brick on edge); and occasional dampness in the buildings may be permitted. This is for the housing of that group which can really afford no rent, Mr. Louw stated, but as the provision of free housing is neither desirable nor practicable, the costs of construction and maintenance must be reduced to a minimum.

STRUCTURAL STANDARDS

To the British mind, accustomed to the idea of building for a number of generations to a structural standard which is completely weatherproof, the classes of housing outlined above as (3) and (4) strike immediately as bringing the standards below what is tolerable. Many South African technicians would agree with this view, especially the master builders who claim that the acceptance of such low standards not only deprives them of the chance to make their contribution to the solution of the problem but is piling up a legacy of slums for the future.

Indeed, the willingness of central and local Government to build by direct labour to such standards while expecting master builders to observe structural conditions as laid down in the by-laws has caused much dissension among the builders, especially in the Cape Town area. Here the Housing Commission adheres rigidly to a limit of £410 for houses of the NE 51/10 type (similar to the NE 51/9 illustrated, but built in pairs), whereas private enterprise's lowest price has been £468. The Cape Master Builders have formed the opinion that the work done by the municipality construction unit is below the standard that had been tendered for by them. In giving this information to the Builders' Durban Conference, Case Bakker said: "This seems to reflect against local authorities, but it will give point to our belief that the time has arrived for local authorities to overhaul and simplify their tender documents to a more practical level. This is essential if private enterprise is ever to get down to departmental cost, which I am sure it can do."

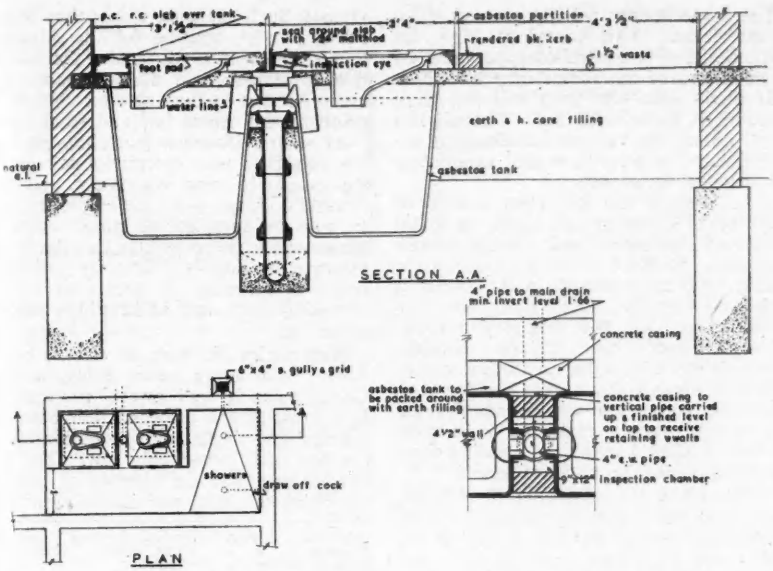
NATIVE BUILDING LABOUR

Housing authorities, and not in the Union only, defend low constructional standards for African housing. They say, first, that the comparatively short rainy seasons justify brick-on-edge without external rendering in view of the need to get natives housed quickly, and, second, that the granting of 30-year leases gives sufficient permanence to encourage tenants to make improvements as their financial position improves. Lastly, and most important, they say that, in pursuance of a policy which is becoming general in most parts of Africa whereby the African must refund over a period the cost of his housing, it is essential that rents be kept to a figure which the African can pay, and that if first cost gets out of hand, the programme fails before it begins. These reasons justify, in South African opinion, a constructional standard which would be unacceptable in most other countries.

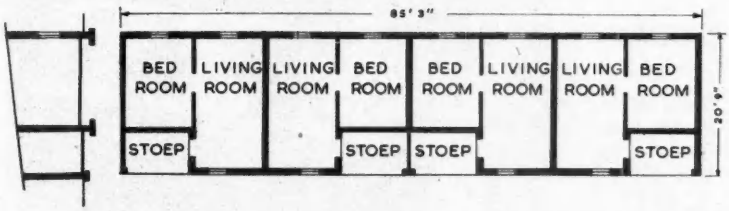
If the present native housing programme in the Union is to be expanded to provide 35,000 houses a year, it can certainly not be done solely with European artisans, and recognition of this key factor four years ago was responsible for the introduction of the Native Building Workers Act of 1951 which provides for the employment of native workmen in areas which are gazetted as Native areas. Since no African may be apprenticed in the Union—an omission which must surely be remedied before long—present standards of workmanship on average are not high, but a system of training-on-the-job plus, in the Johannesburg area at least, vocational training for young Africans, is bound to improve craftsmanship very considerably. Were this training-on-the-job to be combined with the operator principle used in the building of mass housing, Mr. Louw believes that additional savings would result. This would require an amendment to the Native Building Workers Act which it is hoped will soon be made. Certainly the work which I have seen on the Meadowlands estate near Johannesburg (to which the population from Sophiatown in the Western Areas have recently been transferred) is full of encouragement for the future. Here 700 natives, mostly without previous experience and with only seven European supervisors, are building four-roomed houses at the rate of 16 a week. They are working on the "following trades" system most successfully.

HOUSING TYPES AND MATERIALS

Housing for natives in the Union is of two main types—for "bachelors" who work their contract period and then return to the reservations, and family housing. For reasons already given there is a swing towards the latter, and much of this is based on the NE 51/9 house plan. Devised by the NBRI, it consists of a kitchen-dining room, a living-sleeping room, two bedrooms and a combined space for bath and w.c., the total living space being 422 sq. ft., sleeping six to seven. The standard of finish varies



AQUA PRIVY for African Housing at Monomatapa township, Gwelo, S. Rhodesia. Below: African Married Quarters, Gwelo. J. K. Knight, Town engineer.



greatly, according to the rent-paying ability of the tenants. At Meadowlands, each house has running water and water-borne sanitation, but no electric light or gas. Minimum development cost has been shown to be achieved when the gross density is about 10 dwellings to the acre, which (according to D. M. Calderwood, ARIBA, who is a member of the NBRI team and has made a special study of densities) appears to be the maximum possible for such single-storey development after making the necessary allowances for open spaces, etc. The economics of double and multiple storey development, which further increase the gross density, only become attractive when ground values exceed £5,000 an acre.

Experiments have been made with several types of construction — brick, concrete blocks and concrete slabs (cast on the ground and hoisted into position) among them. The cheapest in first cost is undoubtedly brick, though experience of native-built houses is not sufficiently long to form a reliable estimate of annual maintenance of the various types. Roofing is normally asbestos-cement sheeting which has sufficient advantages over galvanised iron to make it worth while using in spite of damage caused by the heavy hail storms which hit South Africa at certain times of the year. Equipment is cut to the minimum, in some cases the w.c. being the only fitment made available, but in most cases the occupants add their own improvements as funds permit. Thus it is quite a common sight to see a native taking out the front door and replacing it with a better article bought from a merchant.

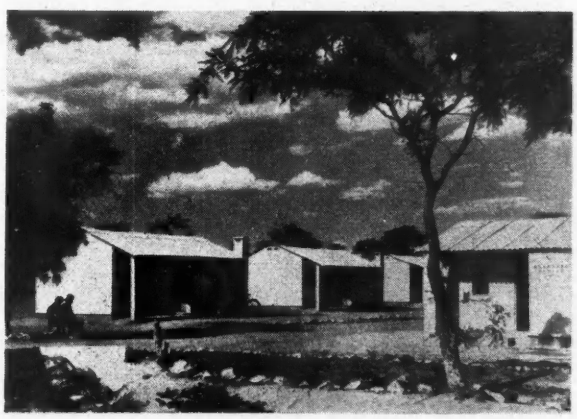
To conclude this section dealing with native housing in the Union, it would seem that it is essential that training be given to more of the Bantu to take an effective part in the building work involved in housing their own people; that private enterprise be better harnessed to assisting works departments in housing schemes; and that funds be made available over a period to enable the fruits of organisation of programmes and of research towards improved low-cost housing to be achieved.

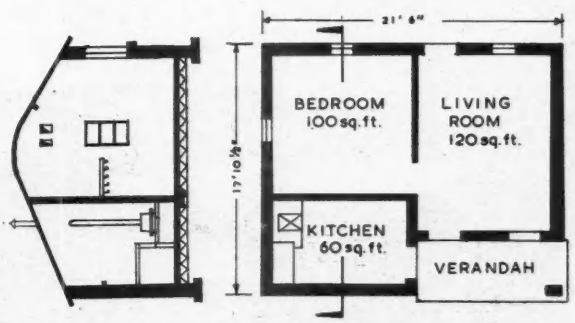
Let Jennings have the final word: "The investigations have shown, that, while the whole project of building the housing is a very large one, it can quite easily be undertaken by the country without unnecessary strain on its resources; the labour, the materials and the will to build all await exploitation."

Housing in British Africa

MANY of the problems arising from African housing met with in the Union of South Africa are common to the British African Territories, and these are well outlined in a Memorandum prepared for circulation to the Governors of the British African Colonies by the Housing Adviser to the Colonial Office (Mr. G. A. Atkinson, BArch, ARIBA).‡ In most of these territories, where the ratio of European to African is much below that of the Union, the problem of money looms very large. By and large, the territories have adopted the practice of requiring that the African shall make the fullest contribution towards the cost of his housing that is practicable, though Government makes its own contribution in various ways. This may take the form of providing houses which are built and financed by central sources, amortised over a period by rentals which allow for redemption, or it may be done (as in Uganda) by providing land and essential

‡ *Housing in British African Territories.* Issued by the Colonial Office. HMSO. Price 1s. 3d. net.





TWO-ROOM AFRICAN HOUSE, Lusaka. A. Lloyd Spencer, FRIBA (Asst. Director (Buildings) PWD), and A. D. Agg, ARIBA.

services such as roads and water, and sometimes electricity, and by encouraging Africans to build their own houses to standard plans, using their own labour assisted by friends and supervised by the Housing Department. Materials at cheap rates may also be made available.

SOUTHERN RHODESIA

Southern Rhodesian African housing policy is firmly based on the need to establish a body of industrialised Africans, stable and with a sense of responsibility, and the Government believes that a first step towards this is the provision of family housing. Mr. G. Ellman Brown, Minister responsible for African housing in Southern Rhodesia (for African housing, notwithstanding the Federation, is a territorial responsibility), is planning to build 3,000 houses this year and in the coming four years to spend £14m. on a housing programme. As an experiment, a 4-roomed house of about 500 sq. ft. is being designed which, with interest at 5 per cent. and a redemption period of 15 years, will let at £3 2s. 6d. a month. The owner-tenant will be granted a 33-year lease. This rental is high for Rhodesia, so a controlled experiment by which two of the rooms may be sub-let to single men who each will pay £1 a month is to be tried out. Though this will reduce the net rent to 22s. 6d. it remains to be seen how this experiment will work out socially.

At present the six chief towns of Southern Rhodesia are short of 9,000 married quarters and 19,000 single quarters, so there is clearly much to be done. But the goodwill in the matter is shown by the fact that no less than £4m. of the territory's £12m. budget goes on African housing, welfare and education. A further experiment towards reducing the backlog is to allocate plots, put in services and foundations and supply materials to a total value of £200, leaving the building work to be done by the African himself.

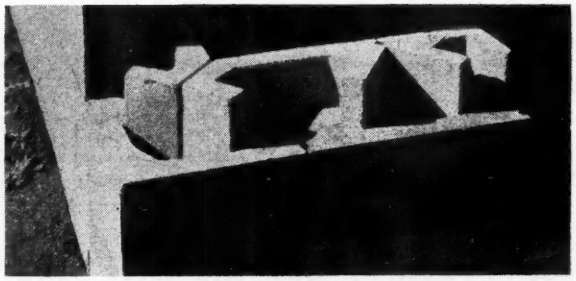
This takes no account of the housing provided by industry, statutory commissions, public utilities (such as the Rhodesian Railways) and private individuals. Such agencies, unless they themselves provide housing for the Africans they employ, must pay, under the Native (Urban Areas) Act, £1 per month for every African in their service. While in principle this seems fair and reasonable, "the other criticism is that although it is the employer who ostensibly pays, it is the employee who ultimately and indirectly does so . . . As the employer tries to keep his total native labour costs at the same figure, he will try to balance an increase in housing rents by reducing wages or refusing increments, or by retrenching staff and utilising his labour better."§

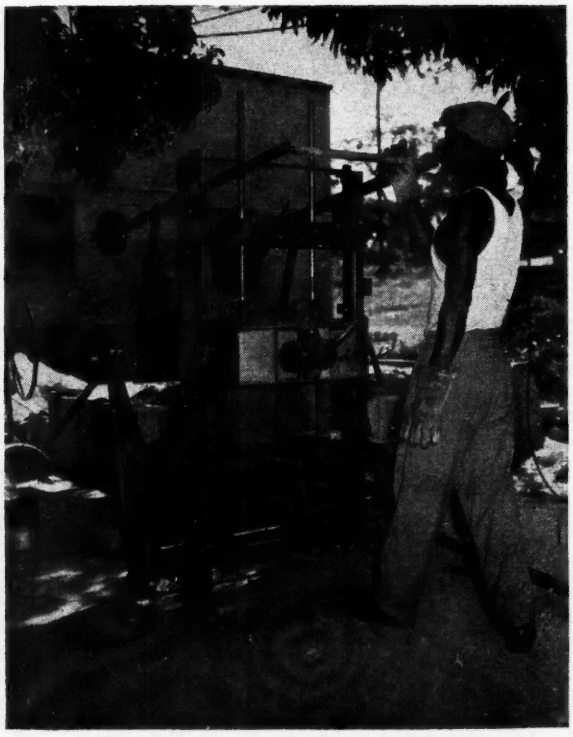
Nevertheless, in spite of what is being done, much more needs doing, as the Government is well aware, particularly in decreasing the disproportion between married and single accommodation while keeping rents reasonably low. Yet the Government has no reserves of wealth on which to draw, and in the event the

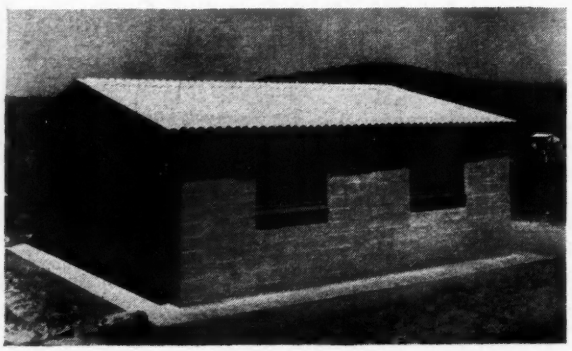
§ *Urban Native Administration in Southern Rhodesia.* By Dr. Hugh Ashton, Director of African Administration, Bulawayo.

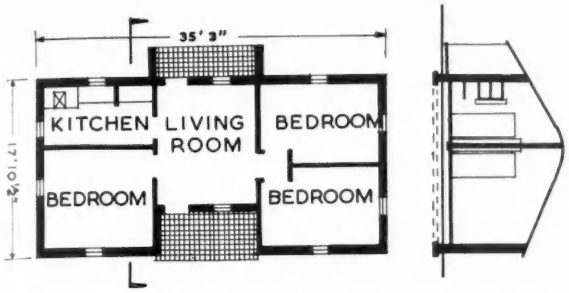
INTERLOCKING BUILDING BLOCKS

INTERLOCKING CONCRETE BLOCKS. These blocks, designed by the Stead Block Co. (Pty.), Ltd., of Durban, Natal, are made of concrete (6:1) mixture in six designs, each design made up of a full and a half size. The standard size is 18 in. long and 8 in. high, and the half size is 4 in. high. The blocks are extruded on a simple machine, finished blocks being left on a pallet. Each machine can produce 700 blocks per 8-hour working day, using four unskilled operators. One concrete mixer serves three block machines. Each block has a compressive strength of approx. 750 lbs. per sq. in. Blocks are laid on a levelled foundation. In the first course the inner face is built of full-size blocks and the outer of the half-size. Full blocks are then laid on both faces until the top of the wall when a 4-in. block on the outer face finishes off level. Blocks are dropped vertically into the inter-locked position, and are so accurate as to form a strong and plumb wall which does not require cement mortar. The square holes between vertical bearing faces on interior and exterior wall faces are filled-in with grout, which sets the block. The walling consists of a 2-in. panel, 5-in. cavity and 2-in. panel, completing a 9-in. cavity wall. Doors, windows, etc., are purpose-made and built in during erection. With this system it is claimed that two unskilled workers can lay 2,000 blocks (equivalent to 10,000 bricks) in an 8-hour day. The 4-room house illustrated was built by one artisan and six native labourers in 24 working hours at a cost of £250. The area is 535 ft. sup.









FOUR-ROOM AFRICAN HOUSE, Lusaka. A. Lloyd Spencer, FRIBA (Asst. Director (Buildings) PWD), and A. D. Agg, ARIBA.

Territory is very dependent on industry, for it is clear that the African, on his minimum basic wage of £4 15s. 6d. per month can do little for himself. There would seem to be a case for devising a plan for placing the burden of African housing more squarely on the shoulders of the local authorities and ratepayers, and for coupling this preliminary step with the granting of additional funds at low interest rates through the Colonial Development Corporation. The suggestion made by Mr. Atkinson in the Colonial Office memorandum already referred to, that an effective way of controlling public investment in housing may be through the establishment of a Central Housing Fund administered by a Central Housing Board, on the pattern of the recent Kenya Housing Ordinance, is surely worth investigating.

NORTHERN RHODESIA

Northern Rhodesia, where industrialisation is of comparatively recent date and is even now confined to a few centres, in particular the Copperbelt, has only recently tackled the matter of providing African housing. In an area as large and widespread as this, where towns are few and the local authorities in some cases are politically immature, central government may well have to remain for some time yet the principal housing authority, and indeed the principal provider of schools, hospitals and other community buildings.

In Northern Rhodesia the Public Works Department commenced its African housing programme in 1948, and from then to the end of October last had constructed 17,133 houses, the best year being 1953 when 3,936 were erected which represents a rate of nearly 11 houses a day. Construction at this rate, in a rather remote country with long communication lines, has only been possible by the complete standardisation and use of local materials not dependent on supplies by rail from the coast.

It is the view of the Assistant Director (Buildings) PWD (Mr. A. Lloyd Spencer, FRIBA, AMTPI) that as time goes on and local authorities get bigger and their staffs more comprehensive, responsibility for the provision of houses in urban areas will pass from the Public Works Department to the local authorities, and this proposal has, in some measure, been implemented in that Livingstone and Ndola municipalities are now erecting houses under their own contract arrangements.

The bulk of PWD housing is being done as 2- and 3-bedroomed houses, complete with latrine, the cost of the former on average (including a share of the external ablution block) being £243 and its floor area 387 sq. ft., while the 3-roomed house costs £336 and has an area of 571 sq. ft. Kitchens are equipped with a small piccaninn wood-burning stove. The average density of houses is approximately 7.5 to the acre, a ratio which appears low by comparison with UK standards; there are however certain laws which control density of African housing. The senior architect in charge of the African housing programme is Mr. A. D. Agg, ARIBA, who is also responsible for schools and other welfare buildings put up in connection with the housing.

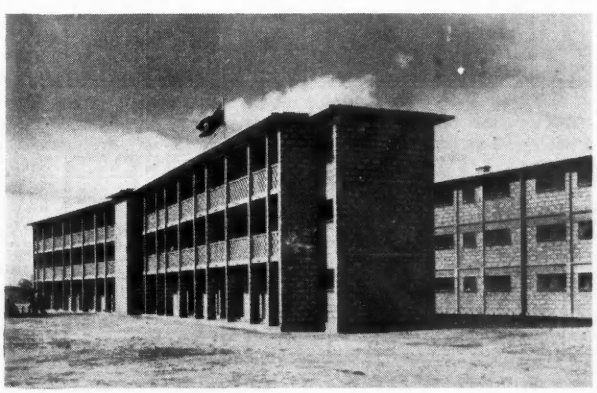
Sociological studies are in hand at present in the Department, in conjunction with members of the Rhodes Livingstone Institute, to ascertain what the African himself really requires in a house, in the shape of size of rooms, internal fittings, etc. Housing to date has largely been in concrete blocks of various kinds, for local brick is of poor quality. A good part of the programme has been built by private contractors, notably by Costain's, direct labour being employed only where the scheme is more than 50 miles from a railhead.

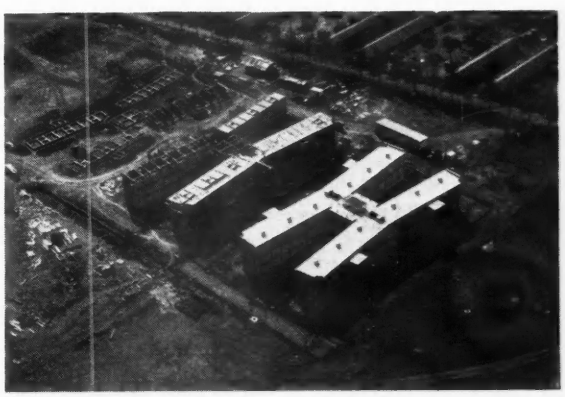
In the Copperbelt, the Mining interests (principally Rhoanglo and Rhodesian Selection Trust) have assumed responsibility for housing their own employees, the building being done by firms of private contractors to plans by the companies' staff architects. Rhoanglo, for instance, have responsibility for housing 11,000 employees at Kitwe, and their architect, David Clark, ARIBA, is producing 2-roomed houses at about £200, and 3-roomed houses at £273 and (slightly larger) at £292, living space being additional. Laing and Roberts, who are active in the Union as well as in British Central Africa, are doing much of the work on the Robconco slab-wall system.

KENYA

It is part of the tragedy of the emergency in Kenya that money and effort which ought to be devoted to the improvement of the African's lot is necessarily being diverted to crushing the Mau Mau movement. One of the effects has been so to denude the African labour market that building costs have rocketed to the extent that it may now cost £800 to build a house with living-room, kitchen and one bedroom. Private enterprise is at present not interested in African housing. No reliable estimate of the number of houses needed for Africans and Asiatics (for Kenya in general and Nairobi particularly are multi-racial in character) has been made, and the announcement in the Legislative Council that a social survey is being considered to assess the size of the urban problem and to plan with local authorities the measure of subsidisation necessary and practicable has been welcomed. An architect is joining the Ministry of Local Government, Health and Housing to help in finding an economic method of building.

Meanwhile Nairobi City Council is





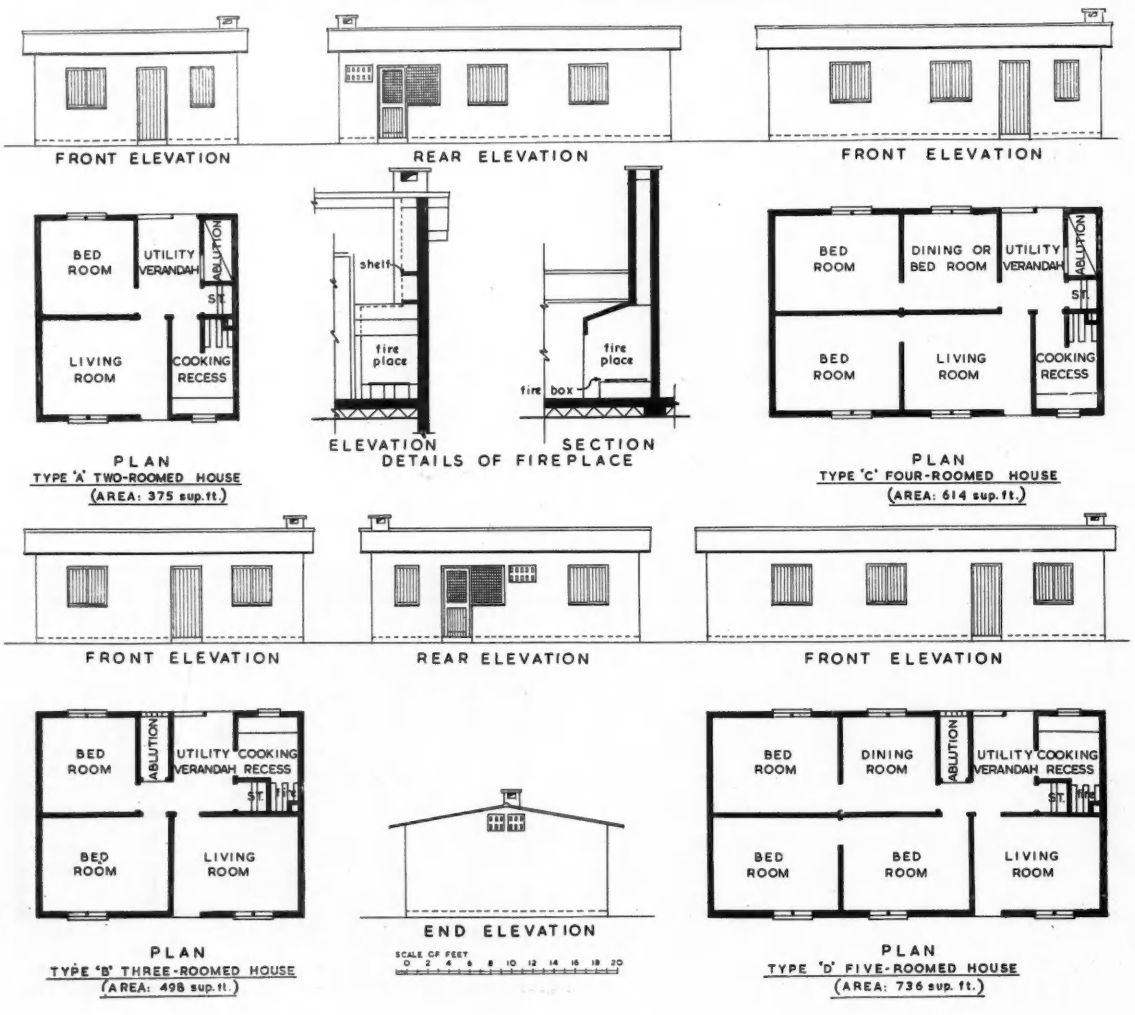
Photos: East African Railways and Harbours

FLATS AT MOMBASA for African railway workers. C. J. Crowe, LRIBA, Architect to East African Railways and Harbours.

proposing to spend £360,000 in the coming six years on Asian flats and £2m. in the next five years on African housing. The Council is not worried unduly over the absence of a reliable estimate of houses needed as it considers the governing factor is the money and building capacity available. Some of the best African housing is being done by the East African Railways under their Architect, Mr. C. J. Crowe, LRIBA.

Kenya is also facing a housing problem other than in the towns, for in order to preserve a balance between town and country, rural housing conditions need

AFRICAN HOUSE (4-room), Kampala, Uganda. The stabilised Murram block walling before rendering can be seen in unfinished house to the right. Right: A self-built African house, Kampala. Nearly all such houses are put up to a rectangular plan. The traditional rondavel is now seldom built. Below: Plans and elevations of four sizes of African houses. C. G. Andrews, ARIBA, Architect to Uganda Protectorate African Housing Department (M. J. Bessell, Director).



attention to prevent too strong a drift to the city. The provision of services such as a water supply, better roads and drainage and assistance in improving or rebuilding homes can help immensely in controlling this drift. A point is made of this need in the Swynnerton Plan for the rehabilitation of Kenya.

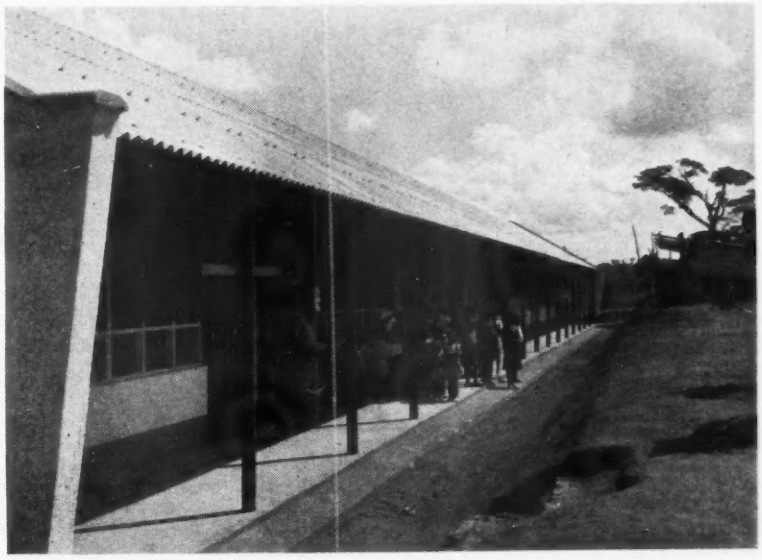
UGANDA

Uganda differs from many other African territories in that it has no large concentrations of urban population. Most of the African population still live on their small farms and the last census of urban workers showed that in the five principal urban centres in 1953 there were under 60,000 Africans employed. But this number is growing and since Africans in Uganda have not been used to living in towns, a new social pattern must be devised to meet the needs. Fortunately the increase in town dwellers though steady is not so fast as to make it impossible to handle the social consequences of development and change.

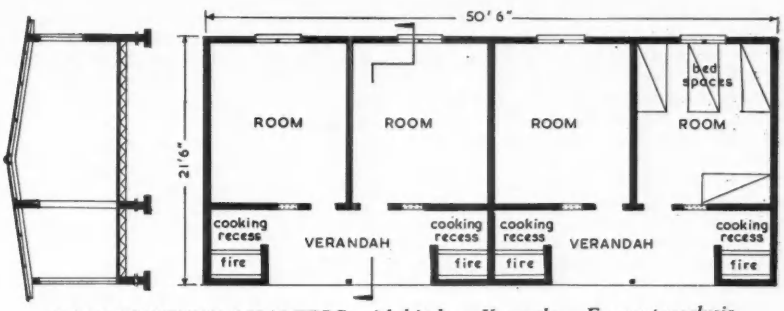
A Report on the housing situation ¶ shows that by the end of 1952, accommodation had been built for about 2,400 wage earners in return for expenditure in the region of £600,000, including services. It was clear that progress on these lines would touch only the fringe of the problem, and it was equally evident that if the tempo was to be speeded up and the new policies on African housing effectively and speedily applied, a special organisation would be needed. Early in 1954 the African Housing Department came into being under Mr. M. J. Bessell as Director. He has two African Housing Officers, an architect and a sociologist. The choice of an architect to fill the technical post in the Department is a considered one and was made on the grounds that one of the most important technical tasks is the study of house design and materials. The sociologist is responsible for the collection of all data essential for social planning. In order to enable the Secretary for Social Services and Local Government to keep in close touch with the development and that the Director of the Housing Department may obtain quick decisions, an executive committee has been set up under the chairmanship of Mr. G. B. Cartland, Secretary for Social Services, which has greatly facilitated the development and application of the new policies.

These policies envisage that the building and development of housing estates in urban areas shall ultimately be a local government responsibility, but for the present that housing estates must remain the care of the Central Government, though certain activities connected with the estates—such as the granting of tenancies, rent collection, the provision of services and the maintenance of buildings—can be undertaken by the township authorities. Government emphasis now is on the provision of houses for the owner-occupier, and a typical example of new development along these lines is seen at the Ntinda estate near Kampala.

¶ *Statement of Policy on African Urban Housing.* Obtainable from the Secretariat, Social Services and Local Government, Entebbe, Uganda Protectorate. Price 1s. 3d.



AN AFRICAN SCHOOL, KAMPALA, on the "Arcon" system.



BARRACK-TYPE QUARTERS, with kitchen, Kampala. For cost analysis see page 420.

This estate has been laid out by the architect to the Department, Mr. C. G. Andrews, ARIBA, and initial services put in, these including roads, storm water drains, water supplies and in some cases electricity for street and house lighting. After various experiments in communal latrines, a separate outside deep pit latrine is provided for each house. At present the water supply is to stand pipes at intervals but piped water may be made available to houses whose tenants can afford it.

The houses themselves may be built on leased plots in the following ways:—

(1) By the Housing Department and offered for sale;

(2) By the Department to an approved plan at the order of a buyer;

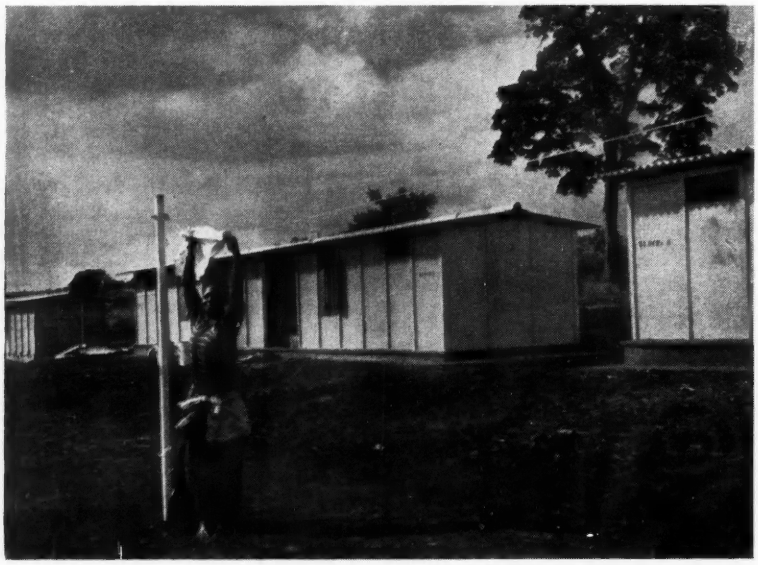
(3) By a contractor to the order of a buyer; here the Department will exercise supervision;

(4) By the owner himeslf, using certain building stores provided by the Department at a reasonable price;

(5) As in (4) above except that the Department will build plinths and supported roofs and allow the owners to build the walls and roof in any approved manner by their own labour;

(6) Tenant purchase through the Department.

In this housing the standard type roofing is asbestos-cement sheeting. Belgian Ardex sheets have been used as being not only cheaper than other available, but also as being less subject to breakage through their greater pliability. Additional reasons for the higher cost of the British product is that it is designed to resist water penetration to a greater degree than the Continental, and also that it is shipped in in large sheets and not crated, with the result that sheets delivered on the site often have hair cracks down the corrugations. British manufacturers might do well to experiment with a reduction of the cement content of the sheets to gain a higher degree of pliability, says Mr. Andrews, as the Department is anxious to use British goods. It may be that the new plant which Universal Asbestos Manufacturing Co. (East Africa), Ltd., is to establish at Tororo, in Uganda, will conduct such experiments.



HOUSES on the Stirling-Astaldi modular post-and-slab system, Kampala.

Uganda is like other British Territories in that its African housing is administered and built on an annual budget. It is hard to see, failing the creation of a housing programme over, say, a five-year period, how the maximum efficiency and research are to be developed. Yet such is the enthusiasm of the Housing Department backed by the Secretariat of Social Services and Local Government that a great deal of research is under way, both in the Department and elsewhere. One such effort is being undertaken by the East African firm of Stirling-Astaldi (Uganda), Ltd., of Kampala, who have evolved a permanent house in a non-traditional form of construction from materials which, for the most part, can be found in Uganda; capable of being transported over long distances without great breakage; and possible to erect with a minimum of skilled supervision.

This modular post-and-panel system uses 4 in. by 4 in. reinforced posts let into the ground at centres to suit a module of 3 ft. 2 in. With the posts in position and grouted in, tongued panels, each 1¼ in. thick and 3 ft. 2 in. wide, are slid into the grooved posts, each panel being reinforced either with steel rods or expanded metal. Doors and windows of local manufacture are placed in position in the walls as these go up. The roof is of precast concrete rafters and purlins reinforced with ¼-in. mild steel rods, sheeted with corrugated asbestos roofing. Corrugated iron or aluminium can also be used. Modular fireplace units are works-fabricated and built in as construction proceeds. Precast shelves, cupboards, etc., are built in likewise. Floors are of compacted murram, covered with 3-in. site-made concrete. The system is worked out on the basis that any unit can be lifted and positioned by one man. A prototype house erected at Ntinda shows that with estates of 50 houses upwards, savings of at least 20 per cent. can be made over traditional construction. The firm have also won a contract at Jinja for 88 houses in open competition, and the 88 houses were built in a record time of 88 days. It is hoped by Mr. Andrews (who has co-operated in the work) that further experience will result in getting the cost down to 15s. 3d. per ft. super, inclusive of site clearance and fittings.

AFRICAN HOUSING, UGANDA

A Breakdown of Costs

THE Directorate of African Housing, Uganda (Director, M. J. Bessell; Architect, C. G. Andrews, ARIBA), have produced a cost-analysis of various types of African housing which are being erected at the Ntinda estate, for home ownership by African workers. Types of accommodation (erected at the end of 1954) analysed are:

Two-roomed quarters and ancillaries: built in Sandcrete blocks. Area 373 sq. ft. Cost per sq. ft. 17.86s. (inc. latrine); 16.28s. (ex. latrine). Total cost £334 12s.

Three-roomed quarters and ancillaries: built in Sandcrete blocks. Area 493 sq. ft. Cost per ft. sup. 17.42s. (inc. latrine); 16.23s. (ex. latrine). Total cost £429 10s.

Four-roomed house: built in Sandcrete blocks. Area 614 sq. ft. Cost per ft. sup. 17.5s. (inc. latrine); 16.58s. (ex. latrine). Total cost £537 10s.

Four-roomed quarters: built in stabilised murram blocks. Area 637 sq. ft. Cost per ft. sup. 18.32s. (inc. latrine); 17.38s. (ex. latrine). Total cost £583 5s.

The full analysis of the two-roomed quarters follows. The ratio of Material cost: Labour cost in all cases is of the order of 70: 30. The Department (whose address is P.O. Box 2183, Kampala, Uganda) is proposing to hold an exhibition of African housing in May. Details were given in *The Builder* of December 24 last.

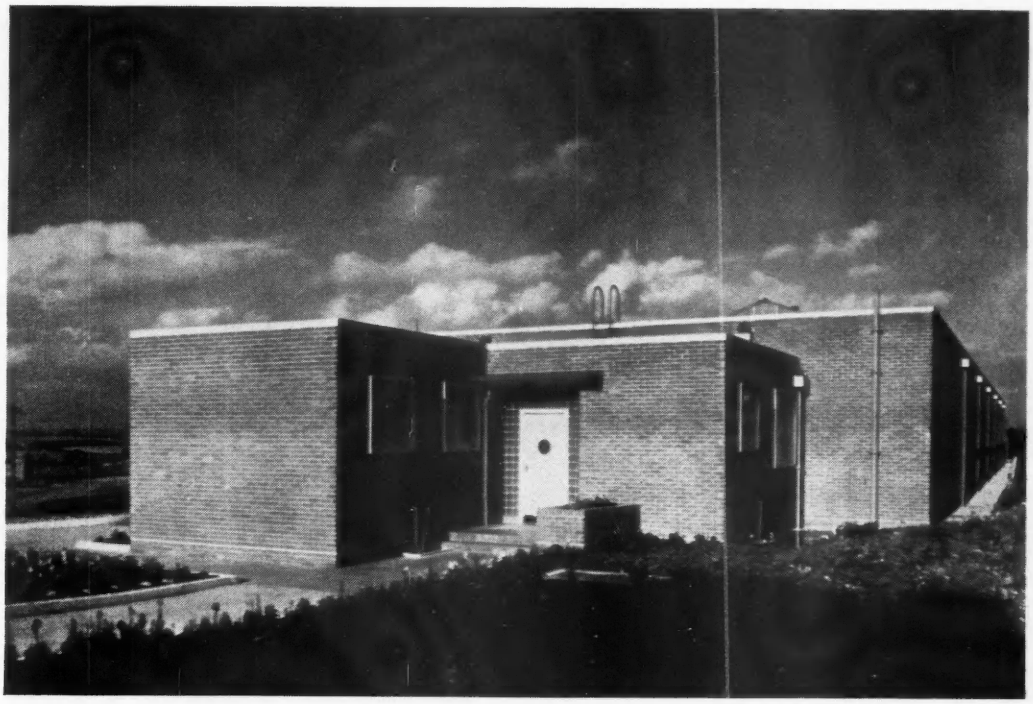
TRADE OPPORTUNITIES, AFRICA

An article by our Special Correspondent on the markets for building plant and materials in the Union and British Central and East Africa begins on page 429.

COST-ANALYSIS. TWO-ROOMED QUARTER AND ANCILLARIES, NTINDA, UGANDA

OPERATION	Total Material cost (shillings)	% Material cost	Total Labour cost (shillings)	% Labour cost	Relative % Labour Material	Total Combined cost (shillings)	% Combined cost	Cost per sq. ft. (shillings)
SITE CLEARING AND SETTING OUT	5.00	0.075	13.40	0.200	268.0	18.40	0.274	–/049
EXCAVATION	—	—	49.15	0.733	—	49.15	0.732	–/132
FOUNDATIONS	71.00	1.059	17.40	0.259	24.50	88.40	0.968	–/236
PLINTH AND D.P.C.	150.70	2.273	20.60	0.300	13.65	171.30	2.557	–/457
WALLING	1,084.78	16.190	925.30	13.818	85.30	2,010.08	30.000	5/363
REINFORCED CONCRETE	158.67	2.370	151.20	2,258	95.30	309.87	4.483	–/827
ROOF CARCASSING	427.50	6.387	27.10	0.405	6.37	454.60	6.775	1/222
ROOF COVERING	610.30	9,106	37.80	0.565	6.09	648.10	9.666	1/750
CONCRETE FLOOR AND SCREEDING	375.00	5.60	89.00	1.375	23.73	464.00	6.925	1/275
WOOD DOORS AND WINDOWS; DOOR AND WINDOW FURNITURE	966.25	14.400	50.40	0.758	5.22	1,016.65	15.100	2/708
DECORATOR	136.50	2.039	59.40	0.887	43.50	195.90	2.950	–/523
PLUMBER	210.32	3.139	50.70	0.751	24.12	261.02	3.895	–/696
SUNDRIES: (Splash approximate and Clearing up only)	136.50	2.039	80.80	1.204	59.20	217.30	3.240	–/574
WATER	10.00	0.148	—	—	—	10.00	0.148	–/021
TRANSPORT	—	—	56.00	0.836	—	56.00	0.836	–/149
PLANT	—	—	26.00	0.388	—	26.00	0.388	–/069
SUPERVISION	—	—	57.00	0.851	—	57.00	0.851	–/152
STORE ORGN.	—	—	53.00	0.792	—	53.00	0.792	–/141
LATRINE	429.43	6.408	161.10	2.420	37.50	590.53	8.818	1/574
TOTAL	4,771.95	71.28	1,925.35	28.75	40.34	6,697.30	99.40	★

★ Area 373 sq. ft. Cost per ft. sup. 17.86s. (inc. latrine), 16.28s. (ex. latrine).



The " clean " entrance to Pithead Baths, Amington Pit, North Warwick Colliery.

PITHEAD BATHS, AMINGTON PIT, NORTH WARWICK COLLIERY for the National Coal Board

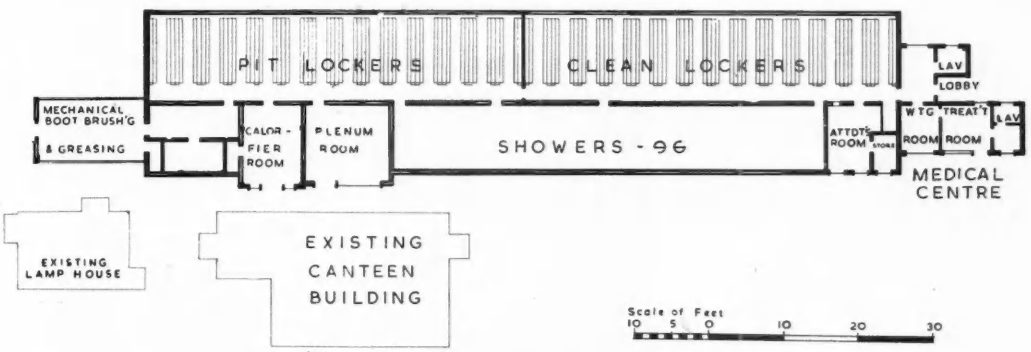
W. A. WOODLAND, FRIBA, West Midland Divisional Architect

Associated Architects: J. P. OSBORNE & SON Builders: W. J. WHITTALL & SON, LTD.

MORE pithead baths were provided in 1954 than in any previous year, according to the National Coal Board. Sixty-nine were completed with accommodation for more than 63,000 men. Altogether there are now 576 baths with locker accommodation for 636,500 men. The first model scheme in the United Kingdom was provided at Howe Bridge Colliery in Lancashire, in 1912, by Fletcher, Burrows and Co., Ltd., though a few experimental installations were provided even before that date; the first of these built by the Butterley Colliery Co., was in 1878.

In 1920, by Act of Parliament, colliery owners were required to pay a levy of a penny a ton of output into the Miners' Welfare Fund, part of which was to be used for building baths. It was not, however, until 1926 that serious attention was given to this form of welfare for the miner, in which Britain lagged behind most other European coal-producing countries. The Mining Industry Act of that year imposed a levy of a shilling in the pound on royalties. This money, payable into the Miners' Welfare Fund, was to be used exclusively for the provision of pithead baths.

The first baths provided by the Fund followed the lines of typical designs on the Continent. They consisted of a main central hall surrounded by bath showers. The hall was used as a changing room by the men and their clothes were suspended from hangers, which were hoisted to the roof, and dried



Plan of Amington Pithead Baths.

by hot pipes which passed underneath. It was later decided to provide baths with lockers instead of hangers, and the first bath of this type was built at Pooley Hall Colliery, Warwickshire, in 1928. All subsequent baths, except those at some small collieries, have been of the locker type. The men have separate changing rooms, each equipped with lockers, for clean and dirty clothes. Before nationalisation the cost of maintaining the baths was met partly, or wholly, by the men, although in a few cases the men paid nothing at all. Now the Board meet the whole of these costs.

In 1952 the arrangements for miners' welfare were changed by Act of Parliament, and the Miners' Welfare Commission and the National Miners' Welfare Joint Council, which had succeeded it, were dissolved. Welfare at the pit, including the building of baths, was made the responsibility of the National Coal Board, while the welfare of the miner (and his family) away from the pit, became the responsibility of a new body, the Coal Industry Social Welfare Organisation. The Board are continuing their policy of providing baths wherever the probable life of the pit justifies them. It is expected that the programme will be virtually complete by the end of next year.

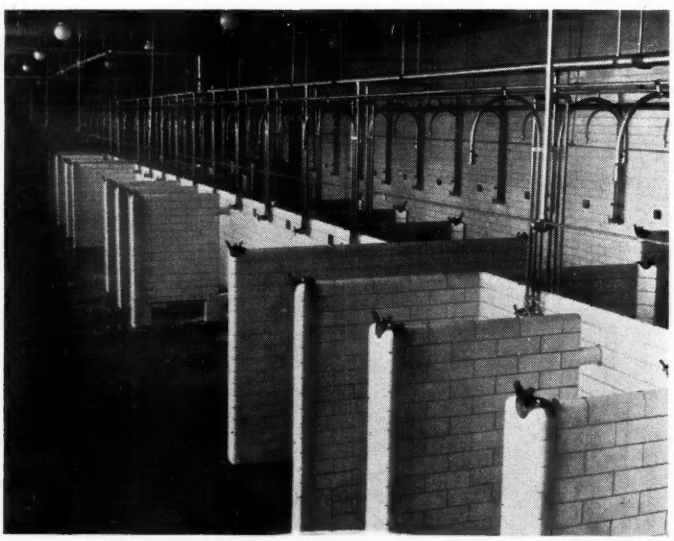
The Board's Divisional Architects design the baths and are responsible for letting the contracts for building them. Some of the modern installations are designed so that the men are under cover from the moment they arrive at the pit until they enter the cage to go down the shaft. Lighting intensity in the gantries leading from some baths to the pit top is gradually reduced so that the men's eyes become accustomed to the dark. The Architect's Department of the Miners' Welfare Commission earned an international reputation for their work in this type of industrial building: the Board have tried to ensure that the high standard is maintained, as the example now illustrated, at Amington Pit, North Warwick Colliery, shows.

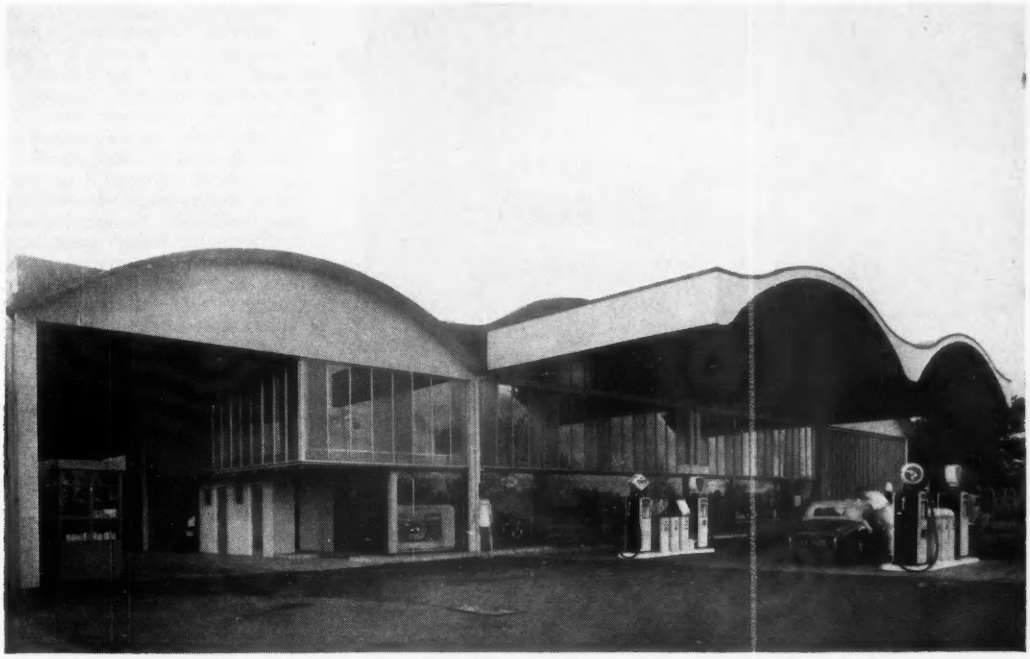
PITHEAD BATHS, AMINGTON PIT, NORTH WARWICK COLLIERY

Entrance from Pit, Amington Pithead Baths.

Sub-contractors and suppliers are: Heating engineers, Young, Austen and Young, Ltd., Nottingham; electrical engineers, John Richards and Co. (Electrical Engineers), Ltd., Burton-on-Trent; reinforced concrete engineers, Matthews and Mumby, Ltd., Manchester; patent glazing, the Puttyless Glazing Co., Ltd., London; sanitary fittings, Adamsez, Ltd., Newcastle-on-Tyne; ironmongery, Walker and Wood, Ltd., Birmingham; water softening plant, Neckar Water Softener Co., Ltd., London; sewage pumping plant, the Pulsometer Engineering Co., Ltd., Reading; lockers, the Speedwell Gear Case Co., Ltd., Birmingham; boot-cleaning machine, Bell and Smart, Ltd., London; and metal windows, Henry Hope and Sons, Ltd., Smethwick.

A typical showers installation.





The garage and showroom from the north-east.

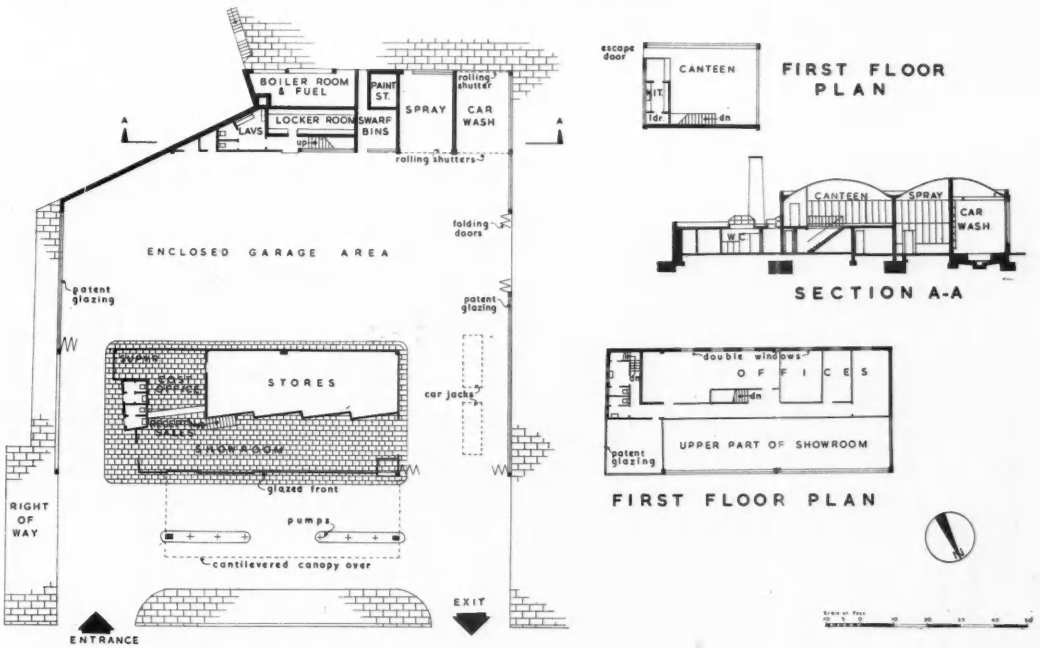
GARAGE IN WESTERN AVENUE, GREENFORD, MIDDLESEX

Architects
WALLIS, GILBERT & PARTNERS

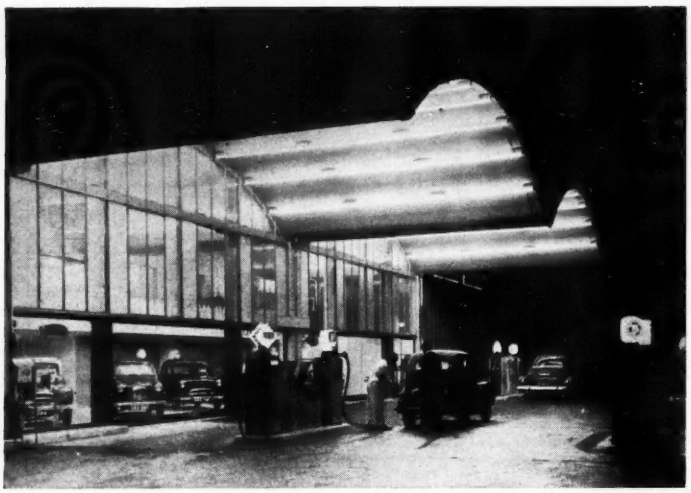
Architect-in-Charge
JOHN WARE, FRIBA

Quantity Surveyors
STANLEY GRIFFITH & PARTNERS

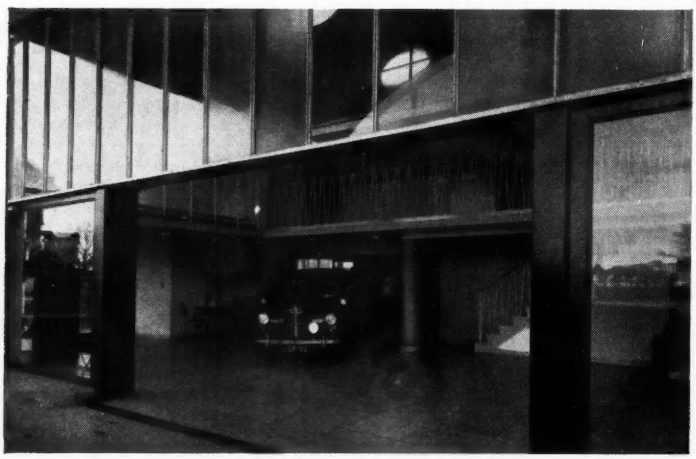
Builders
WHYATT BUILDERS, LTD.



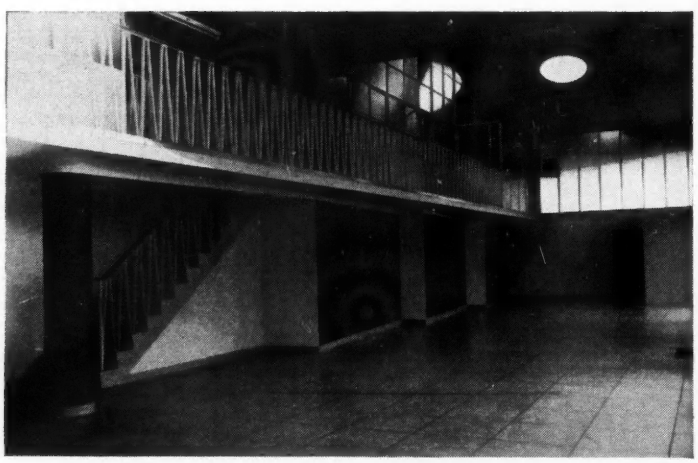
A wider forecourt was added to this original plan and allows for four lines of vehicles obtaining fuel.



Night view, showing illuminated canopy.



The centre window rises to allow cars in and out of the showroom.



The showroom at the north side of the garage.

THESE new garage premises for Perivale Motors, Ltd., replace a corrugated-iron structure which was lacking in many essential amenities, such as adequate headroom, daylighting and thermal insulation. A portion of land to the west of the original site was acquired and made possible the provision of a larger building and a deeper forecourt.

Headroom of 15 ft. was required for maintaining large commercial vehicles in addition to the normal private car trade.

Owing to the proposed widening of Western-avenue, the line of the new building was set back to allow the necessary depth of forecourt and four lines of vehicles can be accommodated for refuelling.

Construction.—The workshop consists of a clear floor area of 136 ft. by 60 ft. and the 3-in. thick reinforced-concrete barrel vault roof, in four bays, covers the entire building, with the exception of a triangular single-storey block at the south-east corner. At the north-east corner of the showroom, above the main entrance, is a boardroom which is hung from the main r.c. stiffener beam.

Finishes.—Daylighting is partly obtained through openings in the barrel vaults, which each contain two sheets of flat glass, divided by an aluminium patent glazing bar between them. The architects selected the colours used for their light-reflecting qualities in relation to the different types of cold cathode lighting in different areas. In the showroom the colours were chosen to form a background to light-coloured cars, now replacing the one-time universal black for body-work.

The cost per ft. cube was 2s. 11d. Following is a list of sub-contractors:

Steel reinforcement, Twisteel Reinforcement, Ltd.; bricks, Uxbridge Flint Brick Co., Ltd.; roofing felt, Rock Asphalte Co., Ltd.; partitions, Messrs. Siddons and Internal Construction, Ltd.; patent glazing, Aygee, Ltd.; patent flooring, E. J. Elgood, Ltd., and Art Pavements and Decorations, Ltd.; central heating, plumbing, ventilation, W. C. Deane, Ltd.; electric wiring, Rashleigh Phipps and Co., Ltd.; electric light fixtures, General Electric Co., Ltd.; sanitary fittings, W. N. Froy and Sons, Ltd.; stairtreads, E. J. Elgood, Ltd.; door furniture, Chubb and Sons Lock and Safe Co., Ltd.; folding gates, Acme Metal Works, Ltd.; rolling shutters, Dennison Kett and Co., Ltd.; iron staircases, Geo. Wright (London), Ltd.; tiling, Carter and Co. (London), Ltd.; shop fittings, Haskins; signs, The Lettering Centre.

GARAGE IN WESTERN AVENUE, GREENFORD, MIDDLESEX

Notes of the Week

THE ARCHITECTURE CLUB

THE Architecture Club held one of its suppers on March 3, followed by a debate on the proposition "That Architecture is too much influenced by Fashion." Under the chairmanship of Lord Esher, the opening speakers were (for) Professor Thomas Bodkin and (against) Sir Howard Robertson. The Club's value as a "ventilator" for such topics lies in an equal membership, by constitution, of architects and laymen, though the latter naturally have an unusual degree of informed interest, writes Basil Marriott.

It is inevitable that some subjects for debate should be a trifle well-worn, but a few recurring and hoary King Charles' heads made none the less diverting cockshies. Speakers' remarks, I understand, are "off the record": but I may perhaps refer to two points which I hoped would be resolved before the evening was over, and hesitated to raise myself. One was that surely all depends on what you mean by "fashion." Apart from the word's presently debased currency in a narrow "dress" connotation, there is a lot of difference between the mere mode of the moment and such concerted "surges" as, for instance, the Baroque—or, for that matter, the Modern—Movement. In the absence of definitions, arguments tended to become double-edged.

Another was the influence ascribed to architectural papers, which would have been quite flattering if only it had come from speakers who opposed the motion! But I do not believe that international forward drives (often underrated as mere fashion) are "powered" solely by a handful of publications, though they can perhaps steer, and certainly should "log" them at risk of their becoming cribs for the laggards. But I enjoyed my evening all the same.

MAINTENANCE OF ST. PAUL'S

LESS than six months after it was launched, on October 21 last, the St. Paul's Cathedral Campaign has achieved its first object of raising the sum of £400,000 for building and restoration work. Announcing this satisfactory response to the appeal, on Tuesday, the Dean of St. Paul's, Dr. W. R. Matthews, asked for further contributions to provide an income of £20,000 a year for the purpose of maintaining the fabric of the cathedral and for the services and the music.

Dr. Matthews gave some details of the building work, which is "now proceeding and gathering pace." The north transept and the east end of the cathedral, he said, are now in the hands of the builders, and the plans for restoring the Chapter House to Wren's original designs have been agreed and work will begin in the spring.

We are sure that those who have contributed so generously to raising the capital sum will wish to see the task completed, while others still have the opportunity to contribute to this great work. Gifts should be sent to the Dean, St. Paul's Cathedral, London, EC4.

COMING EVENTS

FRIDAY, MARCH 11

RIBA.—Exhibition of designs in GEC building competition. 66, Portland-place, W1. Mondays-Fridays 10-7; Saturdays 10-5. Continuing open until March 19.

MONDAY, MARCH 14

ROYAL SOCIETY OF ARTS.—"The Mechanical Properties of Metals," by Professor Hugh Ford, MIMechE. RSA, John Adam-street, WC2. 6 p.m.

THE PLANNING FORUM.—"Britain's Need for Roads," by Mr. M. Francis, 28, King-street, WC2. 6.30 p.m.

TUESDAY, MARCH 15

INSTITUTE OF QUANTITY SURVEYORS (EAST ANGLIAN BRANCH).—"An Introduction to Prestressed Concrete," by Mr. R. C. Blyth, AMICE, MIStructE. Assembly House, Norwich. 7.30 p.m.

HOUSING CENTRE.—"A Plan for Bethnal Green," by students of town planning, University College, London. 13, Suffolk-street, SW1. 6 p.m.

WEDNESDAY, MARCH 16

ROYAL SOCIETY OF ARTS.—"English Church Architecture," by Mr. A. B. Knapp-Fisher, FRIBA, FSA. RSA, John Adam-street, WC2. 2.30 p.m.

VICTORIA AND ALBERT MUSEUM.—"Treasures of the City Companies," by G. R. Hughes, CVO (Company of Goldsmiths). V. & A. Museum, South Kensington, SW7. 6.15 p.m.

THURSDAY, MARCH 17

RICS (LAND SURVEYORS' MEETING).—"The Demarcation of the Disputed India-Pakistan Boundary in Bengal," by Col. R. T. L. Rogers, FRICS, 12, Great George-street, SW1. 5.30 p.m.

RICS (JUNIOR ORGANISATION).—Debate. Talbot Restaurant, London Wall, EC2. 7.40 p.m.

SOCIETY OF CHEMICAL INDUSTRY.—Lecture on research on cement hydration, by Dr. J. W. Jeffery, 11, Upper Belgrave-street, SW1. 6 p.m.

FRIDAY, MARCH 18

INSTITUTION OF MECHANICAL ENGINEERS.—AGM. 1, Birdcage Walk, SW1. 5.30 p.m.

SATURDAY, MARCH 19

ASSOCIATION OF BUILDING TECHNICIANS.—AGM. Recital Room, Royal Festival Hall, SE1. 2.15 p.m.

BUILDING TEACHERS' CONFERENCE.—Spring meeting. CUC Training Centre, Vauxhall Walk, SE11. 10.45 a.m.

View of main elevation in Conduit-street. Below: View in the entrance hall.

WESTBURY HOTEL, CONDUIT-STREET, W1

THE new Westbury Hotel, on the corner of Bond-street and Conduit-street, W1, is the first major hotel to be built in London for 20 years. Leased by Knott Hotels Corporation of America, it should provide a popular centre for US visitors. The architect, Mr. Michael Rosenauer, FRIBA, has provided in his scheme a flexible system of accommodation suited to the needs of present day travellers, including the businessman. The 18 sitting-rooms are so arranged that by a system of double communicating doors they can be combined with bedrooms into suites of various sizes. The decoration of the bedrooms and sitting-rooms offers a variety of colour schemes and the public rooms are decorated in two styles, contemporary and Regency.

The quantity surveyor was Mr. Oswald Parratt, FRICS, the consulting engineers were Andrews, Kent and Stone, and the general contractors, G. E. Wallis & Sons, Ltd. The building has a reinforced concrete frame by Holland & Hannen and Cubitts, Ltd.

News of the Week

CHANGES IN LCC PLAN

THE London County Council's development plan has now been approved, with modifications, by the Minister of Housing and Local Government, Mr. Duncan Sandys. In a letter to Mr. W. G. Fiske, chairman of the Council's Planning committee, the Minister stated that all the main features of the plan have been endorsed. The more important of the changes which have been made have already been discussed in detail with representatives of the Council.

The main changes include: the rezoning for residential use of some 380 acres of land which were allocated for other uses; refusal of permission to increase considerably the density of building in certain districts of special character; and modification of the plan to allow for possible changes in the treatment of the area around St. Paul's Cathedral.

Referring to the area surrounding St. Paul's Cathedral, the Minister says that he cannot help feeling that a unique opportunity is being missed to provide a truly worthy setting for the cathedral. He is at present discussing this matter with representatives of the Council and the Corporation. Meanwhile he has had the plan modified in such a way as not to preclude any changes in the treatment of this area which might be decided upon.

MANCHESTER EDUCATION

SHORTAGE of qualified architectural staff in the City Architect's Department has decided the Manchester Education Committee to give out to architects in private practice preparatory work on school building projects amounting to nearly £500,000. To relieve bottlenecks in the advance planning of other schemes, the Establishment Committee has also agreed to increase the City Architect's technical staff.

COVENTRY CATHEDRAL

WORK started on Monday on building the foundations of the new Coventry Cathedral. The architect, Mr. Basil Spence, OBE, ARA, expects the building of the cathedral to be finished in five years.

The first task of the builders is to excavate more than 3,000 tons of soil from the sloping site. The weight of the new cathedral will be borne on more than 650 concrete piles which will be sunk down to the sandstone substrata.

ARCHITECTURE CLUB SUPPER

A SUPPER of the Architecture Club was held in London on March 3, under the chairmanship of the president, Viscount Esher, and was followed by a debate on the proposition "That Architecture is too much influenced by Fashion." The debate was opened by Professor Thomas Bodkin, MRIA, LittD, HonARIBA, and Sir Howard Robertson, MC, ARA, P-PRIBA, and was continued by Mr. Nigel Birch, Minister of Works, Messrs. A. S. G. Butler, Gontran Goulden, Darcy Braddell, G. A. Jellicoe, Michael Patrick, Ralph Tubbs and Sir Hugh Casson.

CATHEDRAL APPOINTMENTS

MR. G. G. PACE, FSA, FRIBA, of York, has been appointed consultant architect of Durham Cathedral in succession to the late Sir Charles Peers. He has also been appointed to design the new cathedral at Ibadan, Nigeria.

PRA HONOURED

THE Senate of Trinity College, Dublin, has decided to confer the honorary degree of Litt.D on Professor A. E. Richardson, PRA, FRIBA.

TPI GOLD MEDAL AWARD

THE council of the Town Planning Institute have unanimously decided to award the Institute's gold medal to Sir Patrick Abercrombie. The medal is awarded for outstanding achievement in the field of town and country planning and is international. The presentation will take place on May 26, at Caxton Hall, Westminster.

JUNIOR RICS DEBATE

THE Junior Organisation Quantity Surveyors' Committee of the RICS are holding a debate at the Talbot Restaurant, London Wall, EC2, on March 17. The subject of the motion to be discussed is "That the junior of to-day is more of a technician than a professional man." The principal speakers will be: Messrs. J. A. Bridgewater, FRICS, M. O. Sheffield, FRICS, C. Sweett, FRICS, and A. J. Oakes, ARICS. Mr. G. D. Walford, FRICS, will preside.

ARCHITECTURAL APPOINTMENTS

SEVERAL important appointments are announced by Granada Theatres, Ltd., in connection with the Group's expansion plans. Mr. C. W. Sully, ARIBA, has been appointed chief architect for the company. Mr. Sully has been architect to Ilford, Ltd., for the past 17 years.

Mr. S. M. Brecker, assistant to the Surveyor of the City of London Corporation, is to head the group's estates department and Mr. D. J. Sharp, ARIBA, who was previously with Horsham UDC, joins the architect's department.

PROFESSIONAL ANNOUNCEMENTS

MESSRS FAIRBROTHER, HALL AND HEDGES, chartered architects and surveyors, Barclay's Bank Chambers, Birley-street, Blackpool, have taken into partnership MR. NOEL A. COWBURN, DipArch, ARIBA. The name of the firm will continue as before.

The address of MR. H. P. TRENTON, ARIBA, has been changed to 32, Greenhill, Hampstead High-street, NW3. Tel.: Ham. 0839.

MR. ANTHONY DEACON, ARICS, chartered quantity surveyor, has commenced in private practice on his own account at Fitz-Eylwin House, 25, Holborn Viaduct, EC1, where he would be pleased to receive trade literature.

FROM "THE BUILDER" OF 1855

Saturday, March 10, 1855

PAPER FROM WOOD SHAVINGS. — A number of an American paper called *The Albany Journal* was lately printed on paper made from basswood shavings of a peculiar form thrown off by a machine called Beardslee's planing machine. The quality is said to have been good, and even fit for the transfer of line engravings. The pulp is said to be cheaply manufactured by a simple but secret process, applicable to different kinds of wood shavings, and the expectation is that rags will be ultimately driven out of the market altogether by this new process.

COMPETITION NEWS

Liverpool Church House

LIVERPOOL Diocesan Reorganisation Committee announce that the assessor in the Church House Competition, Sir Giles Gilbert Scott, OM, RA, has made his award as follows:—

1st (£800 premium): D. G. MacConville, ARIBA, Bewsey Chambers, Bewsey-street, Warrington.

2nd (£400 premium): S. W. Milburn and Partners, 9, The Esplanade, Sunderland.

3rd (£200 premium): Geoffrey P. Dawson, ARIBA, 28, Parklands-road, Streatham, London, SW16.

An exhibition of all the designs will be held in the Walker Art Gallery, William Brown-street, Liverpool, from March 14 to March 26. The winning designs will be illustrated in the next issue of *The Builder*.

In his report the assessor states that 112 designs were submitted, "a response very satisfactory as regards numbers though the average quality of the designs was not so satisfactory." Sir Giles adds that "the requirement that the buildings should be recognisable as a group of ecclesiastical buildings proved difficult for many, especially for those working in the contemporary style, a very large plain cross on the Chapel being the usual and only indication of a religious character." The winning design, "though not exciting, which is perhaps a character too much sought after to-day at the expense of serenity, is quiet and dignified, relying greatly on the beauty of its materials."

Monument to Prince Henry the Navigator

AN international competition is being promoted by the Portuguese Government for a monument to Prince Henry the Navigator, to be built on the promontory at Sagres on the Atlantic Seaboard.

At least one architect, one civil engineer and one sculptor are to be included in the group submitting each project and the projects themselves are to include, besides the monument, a scheme for the southern zone of the promontory, with provision for a lighthouse and a museum.

The conditions for the competition state that the materials used and the methods of construction shall ensure that the monument be weather resisting, taking into consideration particularly its exposure to saline emanations and atmospheric conditions.

The total cost of the work, including all State charges, must not exceed 35,000,000 escudos.

The competition will consist of two successive tests, the first of which will be eliminatory. A maximum number of five competitors will be eligible to compete in the second test and they will be selected from candidates having obtained the highest marks in the first test.

The closing dates for the submission of drawings for the first part of the competition is April 15, 1955. The first prize is 90,000 escudos (£1=125).

Copies of the conditions can be obtained from the Portuguese Embassy, 103, Sloane-street, SW1.

CORRESPONDENCE

FROG UP OR FROG DOWN?

To the Editor of *The Builder*

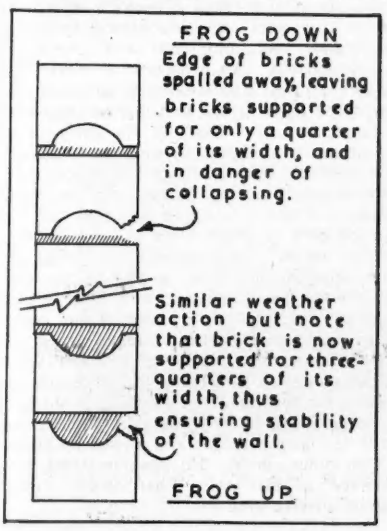
SIR,—The Building Research Station "digest" on the laying of single frog bricks must surely rank as one of the most amazing documents ever to be produced by an independent body of experts. In fact, the text seems more akin to an advertiser's leaflet than an independent report, and can only lead to a lowering of the prestige of an organisation which has hitherto been highly respected.

I would like to offer the following comments on the "digest."

The BRS case for laying these bricks frog down is based on two main arguments: (a) they point out that cavity bricks and blocks are always laid cavity down; and (b) that brickwork consisting of single-frog bricks, laid frog down and frogs unfilled, will still be strong enough for normal housing work, although here they admit that there is room for doubt.

In the case of (a), cavity bricks and blocks were designed for and are still mainly used as internal skins of external walls and for lightweight partitions and in both cases are usually non-load bearing, so that any comparison between these and single-frog bricks, used for an entirely different purpose, must therefore be invalid.

In the case of (b), the BRS seem to have completely missed the point. Very few walls on normal housework fail due to inadequate crushing strength—though here the Station itself admits to some doubt as to what might happen to 4½ in. walls laid frog down, and many 4½ in. walls have to carry loads from roofs and bedroom floors, etc.—whereas many thousands of pounds are spent annually in repairing brickwork damaged by weather and erosion due to atmospheric pollution. In industrial areas of high rainfall and severe frosts, many cases have been found where the weakest part of the bricks, i.e., that part which encloses the frog, has completely disintegrated. When the brickwork is laid frog up—which was the accepted method until quite recently and still is in many parts of the country—the stability of the wall is practically unaffected and can easily be repaired. If the same conditions arise in brickwork laid frog down, especially these "U" frog bricks where the material part of the bricks is more slender, then there is nothing to hold the brick up, and if several bricks close together are affected, this could bring about the collapse of a wall. (See sketch.)


FROG DOWN
Edge of bricks spalled away, leaving bricks supported for only a quarter of its width, and in danger of collapsing.
Similar weather action but note that brick is now supported for three-quarters of its width, thus ensuring stability of the wall.
FROG UP

The question of tie irons, which, in the above mentioned conditions, is more important than ever, is dismissed by the BRS, in a masterly piece of understatement, viz.: "Care will be needed to ensure proper bedding of wall ties." Even when bricks are laid frog up, thus ensuring a solidly built wall, it was quite common to find bricklayers pushing the tie irons into the bed joints after one skin of the cavity wall had been built up, thus nullifying their effect on the strength of the wall. Does the BRS seriously suggest that in these days of "bonus" work, the bricklayers will put an extra thickness of mortar every three feet in order to fill the frog of those bricks which enclose the tie iron? Of course it won't be done and the tie irons will, in consequence, be virtually useless.

On the assumption that all draughtsmen, when drawing sections of an object to illustrate a leaflet, normally show this object the correct way up when it is fixed, it is interesting to note that the BRS digest shows the two single-frog bricks frog upwards and the cavity brick with its cavity in its proper position, i.e., downwards. I suggest that this is neither unimportant, nor is it mere coincidence, but is in fact the normal result of the draughtsman, without thinking about it, drawing these bricks in the way they were intended to be laid.

Finally, it is worth remembering that when this controversy was last raised, nearly all those who favoured "frog down" were people who stood to lose money if they were forced to lay bricks "frog up," whereas most of those who favoured "frog up" had nothing to gain, but were solely concerned by problems of stability and maintenance.

G. BAXTER,
Clerk of Works.
16, Anne-road, Wellingborough.

STEEL SCAFFOLDING

To the Editor of *The Builder*

SIR,—I shall probably be branded as an ingenuous layman but, like many others who directly or indirectly have to pay for building, I am constantly on the look out for any little possibility of keeping down the costs.

On nearly all the steel scaffolding I see erected there is evidence of it having been hired from one of the big scaffolding contractors. I can imagine that for a big new building this is the most economical way of providing scaffolding, but when the job is a small repair one, such as replacement of guttering—or, indeed, if it is housebuilding—may not the cost of scaffolding hire be all out of proportion to the total cost of the work? I imagine that some builders have made themselves less dependent by holding their own stocks of scaffolding for their smaller jobs, but I gather they are in the minority.

I understand there is a plan of "straight hire" by which the builder collects the scaffolding and erects it; but the normal arrangements by which the scaffolding contractor adds to his hire charges the cost of transport and erection look to the lay student of cost like one way in which some saving could be made, quite apart from the convenience to the builder.

I understand that straight hire of sufficient scaffolding for a pair of semi-detached houses for a period of four to five months costs about £24 to £30. This same equipment can be bought for little over £200, so that it only needs a saving on seven or eight pairs of houses to cover the cost of purchase, leaving out the cost of transport of hired scaffolding. The sort of scaffolding unit required for repair work—say, 50 ft. long and 20 ft. high in three lifts—costs about £60 or £70; I should have thought that any builder would prefer ownership, at any rate of a small quantity, to the cost and inconvenience of hiring.

C. H. KITCHIN.
Hawthorndene, Strawberry-vale, N2.

DATES ON CATALOGUES

To the Editor of *The Builder*

SIR,—With reference to Mr. Leech's plea (your last issue) might I suggest that he does what many of us already do, i.e., date each catalogue as it comes into his possession? The cost of effort in so doing is infinitesimal and the result more enlightening than a dated catalogue, by which I mean that it is quite possible for a catalogue to have been in circulation for some years before it is received in answer to a request for information.

Whilst on the subject of catalogues, might I air my pet aversion, which is sales, as opposed to technical literature? I know that the majority of firms do not offend by sending sales literature to people who are only interested in facts, but quite a number of the producers of new materials and articles do. They should realise that it tends to do them more harm than good.

L. H. LOCKLEY [ARICS].
179, Lower Addiscombe-rd., E. Croydon

SAFETY, HEALTH AND WELFARE

To the Editor of *The Builder*

SIR,—The report of a recent decision by the Court of Appeal states that a claim for damages from a lower Court concerning protective goggles supplied in compliance with Section 49 of the Factories Act, 1937, had been reversed.

It appears they were properly worn by an operative when the lenses misted over and the goggles were pulled away from the nose sufficiently to insert finger and thumb to cleanse the lenses. While doing this the eye was injured.

The Appeal Court held that the abovementioned Section did not impose on employers an absolute duty to provide goggles which would ensure *full* protection for the eyes.

Does this mean that a ruling by precedent has now been laid down whereby, unless safety regulations actually prescribe *fullness* of any of its manifold obligations, a partial carrying out of some measure will satisfy the law?

H. E. CAMPBELL
[MICW, AISanE].
40, St. Paul's-road, N1.

TOWN PLANNING INSTITUTE

The Annual Dinner

THE annual dinner of the Town Planning Institute was held at the Dorchester Hotel, W1, on March 3, with the President, Mr. Ernest H. Doubleday, OBE, FRICS, MIMunE, in the chair.

The toast of "The Town Planning Institute" was proposed by MR. J. CHUTER EDE, CH, MP, who, in the course of his speech, not only had some interesting things to say on the early years and history of planning but also surveyed the main problems of the day as they affect the Institute.

After saying that he had been "in this racket" (of planning) from the start, during which time he hoped he had obtained "some development value," Mr. Ede went on to refer to the honoured position the TPI now held among the learned and professional bodies; the traditions of the Institute were now established, and it was held in worldwide esteem.

Mr. Ede said that, despite its origins in the early years of the century, many people still looked on planning as a development of the post-war era, and as yet another attack on the freedom and liberty of the individual. But what was planning? The dictionary definition left out all reference to people, and so missed the real point, which was that planning had as its real justification the creation of beautiful surroundings, the encouragement of a high level of architectural design and the enrichment of human life. In any case, town and country planning had now come to be a permanent and major function of public life.

Continuing, the speaker said that there was little doubt that a proportion of our town dwelling population was content to live in flats—he himself was one, and belonged to the category who would "rather go without vegetables than grow them!" He was convinced of the value of high flats that could be built at a density much greater than was normally contemplated, and it would be interesting to know just what proportion of people would like to live in them. He was sure, however, that the majority still favoured a house with its own garden.

THE EXPANDED TOWNS

Referring to the demolition of old property that must take place in the next 20 years, Mr. Ede said that, despite the contribution of the new towns in housing the displaced population, he thought that here the greatest contribution must come from the expanded towns. It was true that the response to the Town Development Act, 1952, had so far been disappointing, but the reasons, he thought, were mainly financial, and as such would no doubt be overcome.

On the use of land resources and the conservation of agricultural land, Mr. Ede thought that planners were fully alive to the need for saving farmland, but had still quite a lot to learn on the alternative development of land of low agricultural value.

He went on to emphasise the great importance in planning of the development of mixed communities in new housing schemes. A visitor to the post-war housing estates could not fail to be struck, he thought, by the "apartness" of the housing estates that had sprung up. Furthermore, the houses consisted for the most part of dwellings of the same size and character. We were, indeed, creating the opposite of balanced communities. Whatever the solution, he hoped that all would realise that the British way of life was not assisted by the formation of a community segregated on a one-class or one-income basis. If this continued the social contacts that the older form of community encouraged — in playing cricket for example—would be difficult to maintain.

HISTORIC ASSOCIATIONS

Speaking on styles of architecture, Mr. Ede said that while some modern architecture was very lovely, it did not always fit in well with the community to which it was attached. He hoped, therefore, that in the expansion of some of our smaller towns some regard would be paid to the preservation of the historic associations that gave these towns their character.

Mr. Ede paid a tribute to the Town Planning Institute for the imaginative lead it had given in this country and in others in focusing attention on those present problems that were most urgently in the mind of the profession. The difficulties that confronted them were truly gigantic in comprehending and implementing the 1954 Planning Act, but he knew that members of the Institute would do all in their power to smooth the part of the public in these matters and so help build up the goodwill without which planning could not succeed.

INFLUENCE ABROAD

THE PRESIDENT, who seconded the toast of the Institute, dwelt on the influence of the TPI not only in this country but throughout the Commonwealth, and indeed in other countries as well. Examples of this were the demand from such countries as Canada, South Africa and New Zealand for the Institute's examination papers and the interest shown in the Institute's work in Germany when he was there recently. In Germany, strangely enough, interest in the TPI's work was concentrated on finding suitable planning remedies for the dereliction caused by man in his peace-time activities—although they had, of course, plenty of bomb damage to repair. In particular, they were interested in reclaiming land affected by opencast mining and by mining subsidence, and in how to get the support of large industrialists in the fight against dereliction; and also in the problem of welding straggling communities into social entities. The reason for such interest was partly because in Germany there was no technical body in existence corresponding to the Town Planning Institute.

The toast of the "Guests of the Institute," was proposed by Mr. Desmond Heap, Senior Vice-president, and seconded by Lord Kennet, President, Association of Municipal Corporations.

OBITUARY

Sydney K. Greenslade, FRIBA

WE regret to announce the death, which took place on February 28 at Exeter, of Mr. Sydney Kyffin Greenslade, FRIBA. He was 88. Architect of the Welsh National Library, he was Pugin Student, 1891, Grissell Medallist, 1897, and Godwin Bursar, 1900.

W. J. W. writes: S. K. Greenslade, a friend and contemporary of Professor Lethaby, was an artist architect. He did not carry out much work, but what he did was in excellent taste. Two works come to mind, the Welsh National Library and Eton College war memorial, with both of which he was associated. What he lacked was business ability; he found it difficult to deal with builders' extras, drains and plumbing, and here Lethaby was in accord with him. What he needed was a business or practical partner to relieve him of this work and so enable him to concentrate on the actual designing.

Greenslade was a great collector of antiques, specialising in old glass and china. But he did not neglect the artists of his day, and collected etchings by F. L. Griggs, Edgar Wilson and others, and was specially interested in Martin ware, the product of three brothers now all dead. The Martins produced salt-glaze ware in the form of vases, grotesque birds and two-faced jugs, full of character and modelled with devilish artistry. Great excitement would prevail at their pottery at Southall on the opening of a recently fired kiln; only the elect were invited to be present to make their first choice. At that time prices were reasonable, a few guineas. To-day they have soared to high figures. Here Greenslade encouraged and suggested by sketches new forms and shapes for the potters' consideration. He possessed a large collection of their pieces; part at one time was on view at the V. and A. and others at Exeter. An enthusiastic member of the Art Workers' Guild, he had offices for many years at 11, Gray's Inn-square.

Circumstances enabled Greenslade to enjoy life and so pursue his arts and craftsman's interest. A man of wide knowledge of the arts, his crowd were those artists and craftsmen who produced individual works of merit which stand well to-day. He innoculated many with collector's virus (the writer for one) and so enabled them to appreciate and enjoy real and individual craftsmanship. An artist and a great personality, jovial and welcomed wherever he appeared from Devon to Clapham Junction (where he had "digs" in his early days as an assistant, I believe in Caroe's office). Greenslade's description of his experiences was highly amusing. Frequently he went home to Exeter at week-ends, it was said by an eminent architect, "to eat his sisters' cherry cakes." Who would not? Tea at the Greenslades was a never-forgotten event; the table groaned with home-made cakes in variety, cherry preserves (not common jam) and Devonshire cream served by ideal hosts, his sisters, in a room with pleasant water-colours and works of art, an index to the man's character. Although latterly living in retirement at Exeter, he will be remembered by and missed by many of the older school. He was unmarried, but wedded to the arts. What better! Two sisters survive him.

BUILDING MATERIALS, PLANT AND SERVICES

Opportunities for UK Exports to Africa

[*From Our Own Correspondent*]

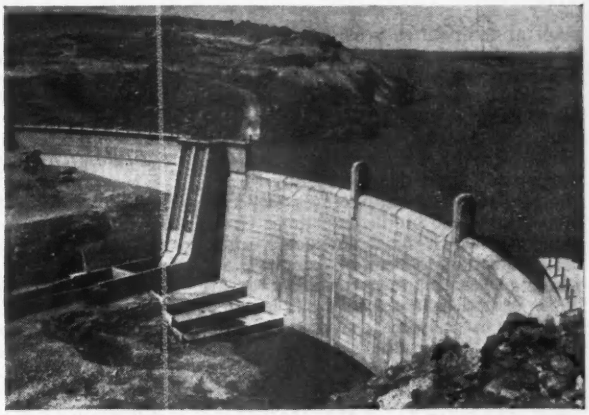
THE importance of the building trades as servicing the great producing industries in British Africa and the Union now becomes increasingly evident. The industrial development in the Union, forced on by the war, has created a need for buildings to contain the processes and house staff and workers which has kept the building trade at full stretch for some years and is likely to continue. The same is true of the Federation of Rhodesia and Nyasaland (developments here being based considerably on the products of the Copperbelt in the north backed by all-round industry). Uganda and Tanganyika have thriving economies, on a necessarily smaller scale, while Kenya, though under a cloud at present time, has a very great potential for agricultural and industrial expansion, the realisation of which cannot now be long delayed.

So far as Britain is concerned, opportunities to share in this expanding market are twofold: firms of builders can themselves set up in business (and, in fact, quite a number of the leading firms of contractors in the United Kingdom have opened branches either in the Union or British Africa, sometimes, indeed, in both); and manufacturers of building materials and plant and equipment, and of building processes, can export either their goods or "know how" to Africa. What does the future offer?

Prospects in the Union

A useful index to the state of the building industry in the Union is given by the figure for building plans passed in the nine principal urban areas. In 1954 these totalled just over £70m., about £9m. more than the previous year. Plans for residential buildings were valued at nearly £45m., about £11m. more than in 1953. Non-residential construction decreased in value, however, from £24,900,000 to £22,700,000.

Of the total of £70m. worth of work nearly £38m. was proposed for the Witwatersrand, which is 20 per cent. higher than in 1953, but a little less than the peak of 1951, when the figure passed the £40m. mark. The building industry should therefore be fully occupied. Shortage of skilled European artisans and to lesser extent of cement (the latter particularly in coastal regions, due to difficulties of distribution) are the only things likely to hold up production.



BRONKHORSTSPRUIT DAM. Designed and constructed by the Department of Irrigation, Union of South Africa.

The question of establishing branches of their businesses in South Africa is one which does not arise here; builders in the United Kingdom who have that in mind will naturally look into things in South Africa (and particularly the difficult matters of labour management and productivity) for themselves before taking a decision.

For tradesmen there is at present plenty of work. Labour rates average perhaps 10s. an hour, though cost of living (and particularly of housing) is above that in the United Kingdom. At present the European operative is well placed, in so far as the African native is not permitted to engage in the crafts but only to work as a labourer. It is well to look squarely in the face the fact that the establishment of a stable, educated African population is an essential need of the future, and that natives may before very long win their way to a fuller participation in the building trades for which many of them are far from disqualified by nature.

There will certainly be a place for many years to come for the European (and particularly the Briton) who knows his craft and is able and willing to supervise building work. The builders' foreman of the right type has a very special place to fill in African development.

There is also a good market for architectural assistants all over Africa but particularly in Rhodesia and the Union. Salaries in excess of the normal in Great Britain are paid, but these should be assessed against cost of living. Practical ability and knowledge of how to manage a contract efficiently are virtues prized in an architectural assistant not less than ability to design.

SELLING ARRANGEMENTS

The present is a good time for manufacturers of materials and plant to review their selling arrangements for future business. The Import Control machinery, instituted in July, 1949, had already been relaxed somewhat in 1954, and the commercial community in the Union confidently expects that control should disappear altogether in the not too distant future. This confidence is based on pronouncements by Ministers in recent months. When this happens the Union will have been restored to free multilateral trading.

An article in the "Board of Trade Journal" of January 29 by the UK Senior Trade Commissioner at Pretoria poses the question whether United Kingdom exporters are geared up to take full advantage of progressive relaxations of import control as made. "Rightly or wrongly, an impression has been gained that some United Kingdom exporters, disappointed at the continuance of import control in South Africa and fully informed about the perhaps inevitable growth of domestic secondary industry under the shelter of that control and the hold which local production has gained on consuming power, have to some extent written off the South African market," the article continues. "The time is more than ripe to review estimates of the South African market, to check up on former or present selling arrangements, and to be ready for the increased area of opportunities for selling to South Africa that undoubtedly will be provided."

It is true that the Union has developed many industries serving the building industry, and some of these products are of a high quality, but it also remains true, in Professor Thornton White's words (see page 405), that "even in the Union the finer items of equipment must be imported." There would seem to be special opportunities for the export of good-quality lifts and air-conditioning

EUROPEAN SCHOOL, FORT JAMESON. Designed by A. Lloyd Spencer, FRIBA (Asst. Director (Buildings) PWD), Lusaka, and C. G. Agg.

plant at competitive prices, thus to challenge a field largely occupied by the American industries.

Complete relaxation of import control must undoubtedly stimulate the home market to greater effort, and may even lead to additional industrial building work. But the main opportunity for the United Kingdom manufacturer will come in displacing the products of those Union industries which have sheltered behind the protection of import control and whose products are less efficient or are higher-priced than they should or could be. It is unlikely that any call for tariff protection would be acceded to in the case of such home industries, for many claiming protection are those providing materials, raw or finished, for the major gold and uranium industries.

Federation of Rhodesia and Nyasaland

"TRADE with the Federation of Rhodesia and Nyasaland is a stimulating test of the exporter's breadth of outlook, adaptability and foresight. He has to reckon with problems and opportunities that are not in themselves unique to the Federation but have at present a rare fascination there." In these guarded terms, which come from the recently issued Economic Survey*, may be glimpsed something of the difficulties of exporting to the new Federation. Though the Federation may seem to have expanded its economy at remarkable speed, the fact yet remains that the total European population is 213,000; Asiatics and Coloured amount to 24,000, and Africans to about six millions. The post-war upsurge in European immigration has now subsided, but the natural increase of Africans continues to accelerate and with it a strenuous effort to improve their standard of living. This is seen in their efforts to obtain higher wage rates in which they have had some success, particularly in Northern Rhodesia where, for example, in January, 1953, only 10 per cent. of drivers and 25 per cent. of bricklayers earned more than £10 monthly. By October of that year the numbers had risen to 41 per cent. of the drivers and 44 per cent. of the bricklayers.

This trend means that wages are becoming an increasing item in operating and production costs, and that a quieter period of expansion is to be expected. More rapid immigration of Europeans, the attraction of more private capital and a rise in productivity of African labour are factors which will and must come into play. In the meantime, the Federation must buy in the cheapest market, and that often proves to be the Union markets across her southern borders, though the United Kingdom yet remains her chief supplier. For instance, of the Rhodesias' imports in 1953 of £129.5m. the United Kingdom supplied £55.5m. and South Africa £38.5m. Of later years the latter has tended to gain a little ground.

So far as building plant and materials are concerned, one of the difficulties that the exporter meets is the long haul from the coast. This has normally been from Beira in Portuguese East Africa, where pressure has been so great that the railing of goods has had to be "phased." The new railway line from Lourenço Marques to Rhodesia is now nearly complete, however, and when opened (expectedly in July) pressure should be eased on the Beira line, and goods should be delivered quicker. But the UK has much to do to overhaul the Union's lead in many of the heavy goods, as the accompanying table shows.

Nevertheless, the Federation regarded as a long-term market is undoubtedly worth investigation, for the country should take a long stride forward with the coming into production of the first stage of the Kariba hydro-electric scheme in 1961. Irrespective of the rival claims of this and the alternative scheme to harness the Kafue river, the fact that a decision has been taken will give a fillip to the whole Federation, and the power which will be made available when the scheme is operating should have a profound effect on the industrialisation of the territory.

BUILDING MATERIALS: IMPORTS INTO RHODESIA

THE FOLLOWING TABLE gives the figures of imports in 1953 of some classes of building material into Southern Rhodesia and Northern Rhodesia. The information has kindly been supplied by the United Kingdom Trade Commissioner's Office, Salisbury, S. Rhodesia.

	Unit	Southern Rhodesia		Northern Rhodesia	
		Quantity	£	Quantity	£
Baths, sinks and fittings therefor					
Total	No	10,322	94,599	N/A	55,569
from United Kingdom		2,838	27,506	—	26,166
from South Africa		7,387	65,775	—	22,385
from Southern Rhodesia		—	—	—	6,899
Steel windows, doors and parts					
Total	Centals	20,292	123,223	28,708	226,165
from United Kingdom		8,289	53,592	2,496	21,591
from South Africa		11,796	67,442	7,934	68,832
from Southern Rhodesia		—	—	18,100	134,592
Earthenware pipes and piping					
Total	Centals	49,871	48,468	129,617	129,246
from United Kingdom		177	486	15	76
from South Africa		48,620	46,748	71,286	64,943
from Southern Rhodesia		—	—	58,316	64,227
Asbestos Cement Sheets					
Total	Th. sq. ft.	2,120	55,096	8,648	254,398
from United Kingdom		3	256	1,197	32,315
from South Africa		2,117	54,829	1,517	42,879
from Southern Rhodesia		—	—	5,933	179,204
Asbestos Cement Pipes and Piping					
Total	Centals	109,344	220,994	50,552	114,328
from United Kingdom		4,237	5,796	258	3,163
from South Africa		105,107	215,918	47,337	106,907
from Southern Rhodesia		—	—	2,957	4,258
Building Boards (excluding Plaster Board)	Value only				
Total		—	153,805	—	110,954
from United Kingdom		—	1,266	—	329
from South Africa		—	110,856	—	91,602
from Norway		—	3,089	—	170
from Finland		—	11,318	—	8,803
from Sweden		—	25,992	—	8,254
Corrugated galvanised sheeting					
Total	Centals	101,620	327,619	130,475	464,727
from United Kingdom		22,163	83,459	80,183	287,798
from South Africa		78,565	241,357	38,377	122,661
Iron and steel pipes and piping					
Total	Centals	115,269	423,235	231,739	783,002
from United Kingdom		81,502	293,821	174,556	568,701
from South Africa		31,677	116,389	40,849	153,003
from France		260	3,797	—	—
from German Republic		329	3,345	210	789
from U.S.A.		1,477	5,820	226	5,802
from Belgium		—	—	3,974	18,231
from Southern Rhodesia		—	—	11,919	36,454
Pipe fittings					
Total	Centals	46,234	271,666	34,819	190,802
from United Kingdom		12,686	124,739	7,186	67,533
from South Africa		31,752	136,543	20,726	102,519
from Australia		1,534	7,736	—	—

* *The Federation of Rhodesia and Nyasaland: Economic and Commercial Conditions*, by the United Kingdom Trade Commissioner at Salisbury. Obtainable from H.M. Stationery Office, Kingsway, London, WC2. and branches, price 5s.

Meanwhile the building industry in the Federation is amply employed and enough opportunity to sell equipment for European buildings and constructional systems and/or components for African housing presents itself to justify immediate market research based not only on immediate sales but on a forward policy. Earth-moving and road-making plant, cranes and elevators, lifts and various forms of builders' ironmongery offer opportunity. More ought to be done in exporting paints, varnishes, etc., where the UK contribution is only £450,000 worth compared with South Africa's export figure of nearly £1m.

Kenya, Uganda and Tanganyika

KENYA: A report just issued by the Special Register Information Service of the Board of Trade states that in spite of the strain imposed by the emergency, now in its third year, normal life of the country has gone on and Nairobi has faith in its future. Industrial projects with a capital of £8.5m. have been started since the emergency began, nearly £1m. has been spent on housing for 16,000 Africans, and £270,000 on medical services. Though by the end of last year the cost of the emergency had totalled £22m., the expansion of the economy in terms of real production has continued unabated.

There has been some change in the position of the building trade over the past three years, and the volume of building completed for private ownership in Nairobi and Mombasa has dropped sharply, as indeed has that in other centres, and not only in Kenya. The following Table, based on the quarterly Economic and Statistical Department, gives the position:—

	1952 year £'000	1953 year £'000	1954 Jan.-June £'000
Kenya			
Nairobi	3,698	3,128	966
Mombasa	1,520	1,438	481
Other Towns	275	558	235
Tanganyika			
Dar es Salaam ..	1,089	911	452
Other Towns	787	1,007	255
Uganda			
Kampala	620	1,569	539
Jinja	494	712	153
Other Towns	74	138	35

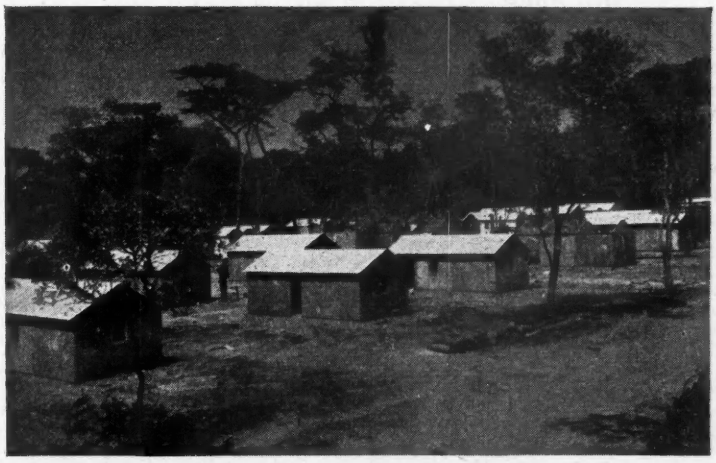
The defection of some part of the Kikuyu, Embu and Meru tribes has cut into Kenya economy in two ways, first by requiring the deployment of men, money and materials to fight the armed insurgents, and second, by depriving industry and in particular the building industry of its most skilled labour. Nevertheless, the end of the emergency should see a rapid spring forward of developments, many of which will require building, and Kenya must be regarded as a potentially strong future market. Big schemes of African housing and welfare buildings are being planned, and commercial developments in Nairobi itself include projected buildings to the value of several £millions in the City Square area, which include a building for the South African Schlesinger organisation (to include a cinema) and a £250,000 block of shops and offices for the Car and General Equipment Company. Building work by and for the Kenya Public Works Department continues at a high level: during 1952 and 1953 the Department constructed buildings costing £5.7m. by direct works and £1.7m. by outside contractors. The East African Railways and Harbours Administration are also building steadily both for harbour and railway administration and for their employees.

TANGANYIKA: Tanganyika's economy is favourable, as is her balance of trade, the latter for the first seven months of 1954 being £16,560,000 retained imports as against £20,642,000 domestic exports, showing a favourable balance of £4,082,000. A warning was recently given by the Governor, Sir Edward Twining, that UK exporters were in danger of finding themselves ousted from the Tanganyika market by foreign competitors who took more trouble with the potential customers and provided better services. Related to this question was the tendency of British firms to concentrate on distributors in Nairobi which "reveals an extraordinary lack of knowledge of East African markets and trade conditions on the part of many British manufacturers and exporters.... Surely Tanganyika is big enough to warrant the carrying of stocks." It is clear that any trade investigation of British East Africa should study Tanganyika and its capital, Dar es Salaam, in particular, where the municipality is about to spend nearly £250,000 on road-works, sewerage and street lighting.

UGANDA: Here the balance of trade is also favourable, retained imports for the first seven months of 1954 being £13,372,000 and exports being £28,723,000—a favourable balance of £15,351,000. Railways are being extended, and a 200-mile-long extension of the West Uganda line is expected to open this year, while a new line extending 120 miles northwards from Kampala is under consideration.

There is a good deal of building going on, particularly in the three main centres of Kampala, Jinja and Entebbe, both by private developers and by the PWD. Large schemes of African housing, initiated by the Uganda Government African Housing Department, also offer markets for roofings, block-making machines ironmongery, etc., but prices are keen. There has been a shortage of cement, and some cement was ordered from overseas during the autumn of last year. A new factory to produce mangalore tiles is expected to be in production at Jinja by the end of the year, owned by the Uganda Public Works Department. Asbestos cement sheeting will be shortly made by a new company, Universal Asbestos Manufacturing Co. (East Africa), Ltd., at Tororo.

Exporters who wish to make preliminary investigation of opportunities offered by the markets in the Union of South Africa, the Federation of Rhodesia and Nyasaland, and the British East African territories can obtain help and advice from the Commercial Relations and Exports Department, Board of Trade, Horse Guards-avenue, London, SW1.



AFRICAN HOUSING on the "No Fines" system, Bancroft Mine Township, N. Rhodesia, for Rhoanglo Mine Services, Ltd. Architect: David E. Clark.

DIRECTORY

Housing Adviser to the Colonial Office (Mr. G. A. Atkinson, ARIBA), c/o Colonial Office, The Church House, Great Smith-street, SW1.

Board of Trade, Export Services Branch, Lacon House, Theobalds-road, London, WC1.

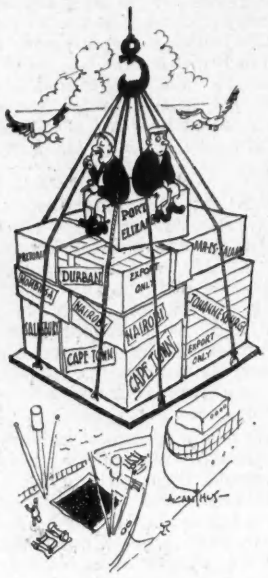
Board of Trade, Commercial Relations and Export Department, Horse Guards-avenue, London, SW1. Tel.: Trafalgar 8855.

Institute of South African Architects (Registrar: J. S. Jarvis), 83-85, Walter Wise Building, PO Box 7322, Johannesburg.

Chapter of South African Quantity Surveyors, 303, Kelvin House, Marshall-street, Johannesburg.

National Federation of Building Trade Employers of South Africa (G. de C. Malherbe, Director), Federated House, PO Box 2375, Johannesburg.

Directorate of Native Works, City of Johannesburg (G. Archibald, Director), 16, Hoek-street, Johannesburg. Tel.: 221534.



"No! Brighton as usual for us this year."

National Building Research Institute, PO Box 395, Pretoria. (Dr. N. Stutterheim, Director (acting).)

Concrete Association of South Africa (F. S. Fulton, Director), PO Box 3899, 3rd floor, Libertas Building, 62, Marshall-street, Johannesburg.

Master Builders' Association of S. Rhodesia (A. G. Plumb, secretary), 88b, Fife-street, Bulawayo.

Southern Rhodesia Society of Architects, Grand Hotel Annexe, Speke-avenue, Salisbury, S. Rhodesia.

Public Works Department, N. Rhodesia (A. Lloyd Spencer, FRIBA, AMTPI, Asst. Director, Buildings), PO Box 137, Lusaka, N. Rhodesia.

Town Planning Department, Government of Kenya (Thornley Dyer, FRIBA, Town Planning Officer), PO Box 89, Nairobi, Kenya.

East African Railways and Harbours (C. J. Crowe, LRIBA, Chief Architect), PO Box 79, Nairobi, Kenya.

City of Nairobi Town Planning Office (Sydney Lock, Town Planning Officer), City Building, Nairobi, Kenya.

East African Society of Architects (R. W. Polkinghorne, ARIBA, Hon. Secretary), c/o Hughes and Polkinghorne, architects, Lamberts - buildings, Delamere - avenue, Nairobi, Kenya.

Uganda Protectorate African Housing Department (Mowbray J. Bessell, Director, C. G. Andrews, ARIBA, Architect), PO Box 2183, Kampala, Uganda.

Uganda Protectorate PWD (J. K. Watson, Deputy Director; Kenneth Begg, FRIBA, Chief Architect), Government Buildings, Entebbe, Uganda.

UK TRADE REPRESENTATIVES

FOLLOWING is a list of UK Trade Commissioners and representatives in the Union of South Africa, the Federation of Rhodesia and Nyasaland, and East Africa:

South Africa

PRETORIA.—Mr. C. Kemp, CBE, UK Senior Trade Commissioner in the Union of South Africa, PO Box 1982, Kerry Building, 238 Vermeulen-street, Pretoria. ("Sencom, Pretoria.") (Tel.: 3-7471, three lines.)

CAPE TOWN.—Mr. A. G. C. Deuber, OBE, UK Trade Commissioner, PO Box 1346. Colonial Orphan Chamber Buildings, 41, Parliament-street, Cape Town. ("Austere, Cape Town.") (Tel.: 2-1737.)

JOHANNESBURG.—Mr. L. Harrison, CMG, UK Trade Commissioner, PO Box 10101, Pritchard House, Pritchard-street, Johannesburg. ("Austere, Johannesburg.") (Tel.: 23-6561/2.)

DURBAN.—Mr. T. S. Sydenham-Clarke, UK Trade Commissioner, PO Box 845, United Buildings, Smith-street, Durban. ("Austere, Durban.") (Tel.: 22422.)

United Kingdom Trade Correspondents

CAPE PROVINCE.—Mr. W. R. Fryer, PO Box 48, Port Elizabeth.

BASUTOLAND.—The Deputy Resident Commissioner and Government Secretary, Maseru.

SOUTH-WEST AFRICA.—Messrs. Lorentz and Bone (Solicitors), (PO Box 85, for all letters), (PO Box 1664 for all magazines, circulars, trade literature, etc.), Kaiser Strasse, Windhoek.

Federation of Rhodesia and Nyasaland

SALISBURY: SOUTHERN RHODESIA.—Mr. H. W. Woodruff, UK Trade Commissioner, PO Box 984, Sanlam Building, Baker-avenue, Salisbury. ("Tradcom, Salisbury.") (Tel.: 24341.)

BULAWAYO: SOUTHERN RHODESIA.—Mr. J. Stafford, Office of the UK Trade Commissioner, PO Box 1514, 2nd Floor, African Life Building, Main-street, Bulawayo. (Tel.: 60606.)

East Africa

NAIROBI.—Mr. G. T. Dow-Smith, OBE, UK Trade Commissioner, PO Box 220, Memorial Hall, Delamere-avenue, Nairobi, Kenya Colony. ("Britishers, Nairobi.") (Tel.: 25808 and 25809.)

United Kingdom Trade Correspondents

KENYA PROTECTORATE.—The Regional Commissioner of Customs, Mombasa.

TANGANYIKA TERRITORY.—The Principal Executive Officer, Department of Commerce, PO Box 234, Dar-es-Salaam.

UGANDA PROTECTORATE.—The Commissioner for Commerce, PO Box 1331, Kampala.

ZANZIBAR.—The Comptroller of Customs.

SLATE QUARRIES

A report based on the census of production for 1951 has been published by the Board of Trade on Slate Quarries and Mines (Volume 1, Trade D), price 1s. 6d.

TRADE MISSION TO EGYPT AND THE SUDAN

Opportunities for Builders and Civil Engineers

THE opportunities for expanding the export of British goods to Egypt, the Sudan and Ethiopia were described to the Press in London, on Monday, by members of the British Trade Mission that has just returned from a visit to those countries.

MR. G. C. R. ELEY, the leader of the mission, said that they had been received with great warmth and friendliness and an "extraordinary degree of eager co-operation" in all three countries. There existed he said, a genuine liking for, and appreciation of, the value of British goods, and our traditional reputation for quality still stood us in good stead. Nevertheless, if we were to expand our exports to these countries, and retrieve the lost ground in Egypt now that the political difficulties there had been removed, our price and delivery terms must be as good as possible, for our competitors were now pressing their goods hard.

All three countries, Mr. Eley continued, had plans for development, of which Egypt's were the largest, which should provide scope for British capital goods and for civil engineers. Ethiopia was in a very sound financial position and was intent on the development of her resources, and the next ten years were likely to see that country taking considerable forward strides.

Asked what were the particular opportunities available for British building and civil engineering firms in the countries visited, MR. MAURICE LAING, a member of the mission, said that, in Egypt, although local contractors built well and cheaply, there were still opportunities open to Britain in the larger civil engineering contracts. Other things being equal, Britain was still favoured for this work, partly on account of the fact that the earlier projects in the Nile valley had largely been carried out by British firms. There was also scope for similar projects in the Sudan but the country was poorer and there would accordingly be fewer of such schemes; there was not, however, so much competition there from local contractors as in Egypt.

Mr. Laing did not think that there was much scope for the import of building materials and components into Egypt, as that country was more or less self-sufficient in this sphere. There was however more scope for such goods in the Sudan and Ethiopia, which already imported many of their materials and components from this country; the problem here, he said, was to maintain these markets as well as to expand them.

TILES IN SOUTH AFRICA

The Marley Tile Company, Ltd., of Riverhead, Sevenoaks, Kent, have recently completed and opened the first 18,000 sq. ft. unit of their South African factory at Pretoriusstad, Nigel, Transvaal, 40 miles from Johannesburg. This initial unit stands in eight acres of ground, and will supply the company's products to the Cape Province, Transvaal, the Orange Free State and Rhodesias.

A row of old people's houses in which the room units are made of plaster cast in one piece. The brick veneer and "Marseilles" tiles give the houses the appearance of a more expensive method of construction.

A NEW DEVELOPMENT IN AUSTRALIAN PLASTER HOUSES

Complete Rooms Cast in One Piece

By GEOFF DE FRAGA

AUSTRALIA'S use of plaster for structural, load-bearing walls has now branched out in a new direction—the manufacture of four complete walls and ceiling poured in one unit. Cast at the factory, these units are transported to the site and there juxtaposed to form complete internal framework for dwellings which can be finished in a variety of ways.

Resulting from ingenious planning to conform with standard building regulations, the cast plaster cells are made of two sizes only, yet a wide variety of interior design is possible. Each room has one dimension of 8 ft. 9 in., but while the length of the larger is 12 ft. 6 in. the width of the smaller is 5ft. 0 in.

Some idea of the elasticity of design allowed by using rooms of only these dimensions can be gained by cutting a number of pieces of cardboard to scale and moving them into position to make complete houses, as shown in the accompanying plans.

WIDER USES FORESEEN

The makers, Aychar Pty., Ltd., Melbourne, Victoria, foresee still wider uses for the two standard cells. Hospitals, hotels, guest-houses, schools, factory offices, service stations, shops and railway station buildings are among the constructions they deem practicable without using any more than the two standard cells, so it is claimed.

Apart from its fire resistance, the increase in thermal and acoustic insulation, and the cheapness of plaster in those countries with adequate gypsum deposits, great savings are effected in labour compared with that normally employed with other types of building.

Says the architect, Mr. Bernard Evans (of Melbourne): "The man wandering around with his three-foot rule is largely eliminated. The Aychar method also eliminates plastering, skirting, architraves, picture-rails, jambs, ceiling joists, fibro-plaster ceilings, hangers, internal lintels and door frames."

FOUNDATIONS

The units bed down on any standard foundations — brick, wood, stumps or concrete. The inside only of the building is shop made, leaving the builder full scope for individual treatment externally.

Internally the houses have the same advantages of cavity construction that were so highly prized when cavity brick construction was a commercial practicability in Australia. All conduit and piping can be installed and repaired cheaply and quickly, because an air cavity is left between the adjacent walls of any pair of cells.

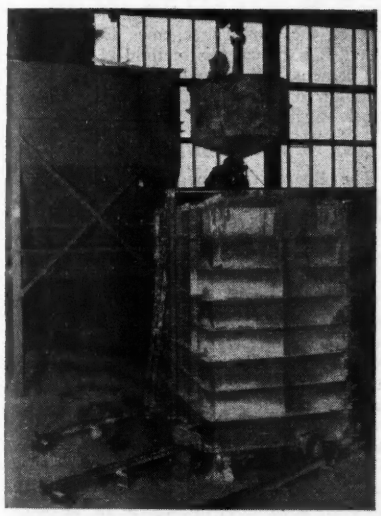
As with the pouring of the *single plaster wall that was hailed in Australia as a building revolution several months ago, doors and windows are set out in position before the plaster is poured.

SPEED OF ERECTION

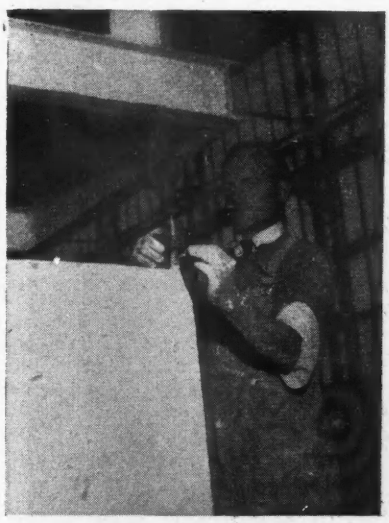
In the Aychar house, each room has a domed ceiling, in the centre of which is a square opening for ventilation and flush lighting.

Speed of erection is another point in favour of the Aychar house, for which world patents

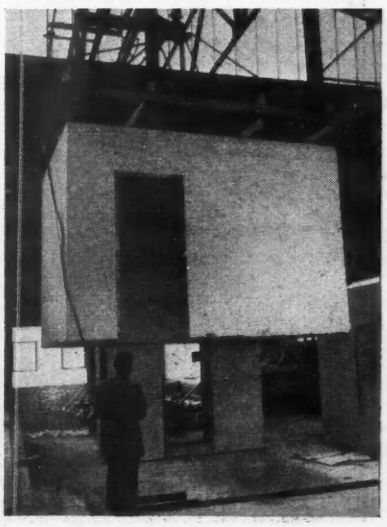
* An illustrated article on this method appeared in *The Builder* of March 26 last.



One of the plaster moulds. The plaster is about to be poured from the container above into the aperture left in the steel sections at the top of the mould.



When the plaster has set the steel framework is rolled back and a suspended lifting frame attached to threaded iron rods at each corner of the plaster cell.



The next step is to lift the cells clear of the mould and remove them to another part of the factory for drying, which is carried out with the aid of hot air.

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have been obtained. The cells move on standard vehicles along standard roads, and within 24 hours of delivery of the cells to the building site, all trades can begin work. They then stay on the job until their own particular responsibilities are ended. In construction of rows of houses and estates, this saving in man-hours is considerable.

FACTORY IN PRODUCTION

For the Aychar house—the result of five years' research and planning by Mr. Bernard Evans—a £A65,000 factory has been built in Warrigal-road, Moorabbin, a suburb of Melbourne.

A concrete mould has been cast for each of the two room sizes, and around these are placed reinforced steel formwork to give a 2-in. thickness to the wall to be poured. Before pouring, however, reinforcement (six-inch mesh galvanised steel wire) is placed in position and the framework for doors and windows set in position.

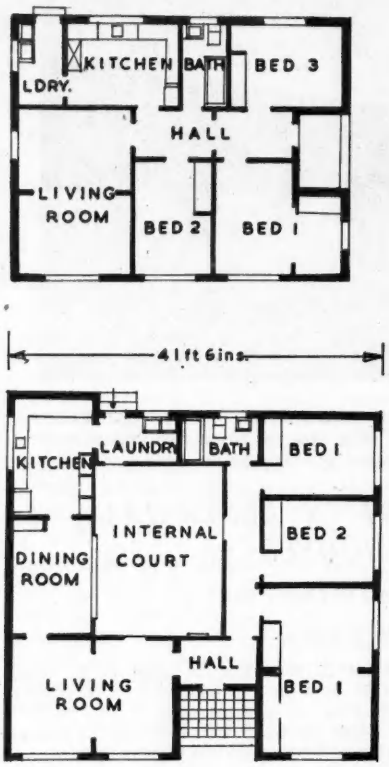
From a big hopper, the requisite amount of plaster is poured into a mixing bucket and mechanically mixed. The bucket is electrically hoisted over the aperture in the top of the mould, and plaster is poured. When it has set and cooled, the steel formwork is rolled back and the plaster cell lifted off the central concrete mould.

HOT-AIR DRIERS

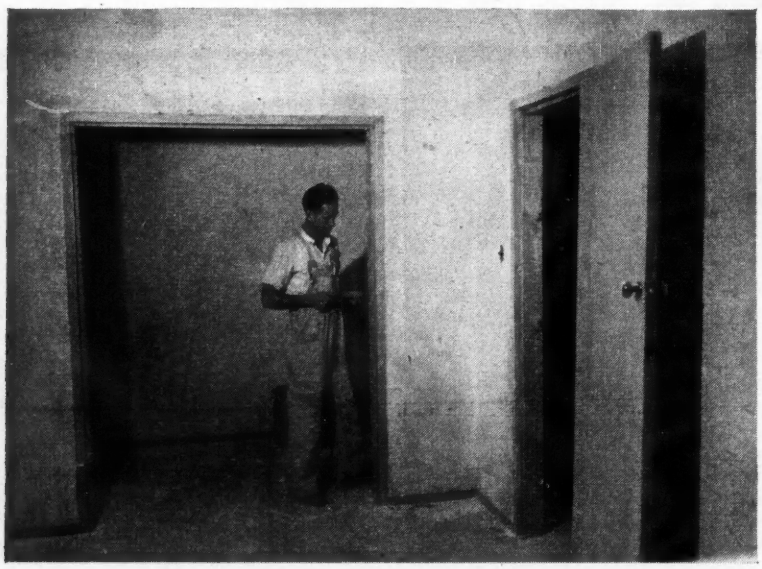
A hot-air generator capable of drying off four rooms in 24 hours has been installed to dry each cell completely before removal from the factory. This is regarded as necessary because of the thickness of the plaster where the ceiling arches over from the walls, which measures 15 in. at its thickest part.

Compression tests made by Australia's Commonwealth Scientific and Industrial Research Organisation show the cells to be adequate in strength for the support of a normal tiled roof.

Further Aychar plans provide for the use of cells in the ground floors of two-storey constructions.



Plans of two types of house using the "Aychar" system. The first plan (top) incorporates six large and five small plaster units, and that below, with internal courtyard, eight large & three small units.



Cavities exist between all walls, internal and external, and provide facilities for the installation of and alterations to lighting and plumbing. The workman is seen standing in one of the smaller cells, to be used in this standard double bedroom as a dressing and wardrobe annexe.

WATER POWER IN SCOTLAND

Hydro-Electric Board's Report

THE North of Scotland Hydro-Electric Board's Annual Report for 1954 has now been published. It states that four dams were completed during the year and construction was started on six new dams and continued on a further 17.

The Trief cement plant for Cluanie and Loyne dams came into full operation; the Trief process makes use of blast furnace slag, ground very fine, in place of cement to the extent of 70 per cent., and the concrete produced by this process has given more consistent results than were at first estimated. Experiments with the partial replacement of cement by fly ash from pulverised coal burning power stations continued. This process is ready for adoption but it only gives a 30 per cent. saving in cement as against 70 per cent. with the Trief process.

At Lawers dam, the Cementation Co. used a continuously travelling shutter to construct the intake tower of the dam. The concrete was poured continuously from a height of 100 ft. instead of being placed in successive lifts, and the operation was carried out in 13½ days. Similar climbing shutters have also been effectively used in placing the concrete for the linings of vertical tunnels and shafts up to a height of 500 ft.

During the year, 163,000 tons of cement were used on the Board's works. In May, and for the remainder of the summer, supplies of home cement sent to Scotland were insufficient and in order to keep their works going, the Board were, at short notice, compelled to authorise the importation of Continental cement at a price (including import duty) above that of British cement. If the Board had not taken this step, progress would have been seriously affected and contractors forced to pay off men. It is with this situation in mind that the Board are continuing to urge for more cement to be manufactured in Scotland.

Bulk cement was delivered in 1954 to one of the Board's schemes for the first time. It is hoped this method of transporting cement will spread in Scotland as, in addition to easing handling, it would save paper bagging.

STONE BUILDING

The Board continued to give practical assistance to the stone building and quarrying industries in the North of Scotland by using stone wherever possible in the construction of their power stations, sub-station buildings and staff houses. The most interesting development last year was the joint decision of the County Council of Rossshire, the Forestry Commission and the Board to carry out a joint scheme for building a village of 28 stone houses at Contin, near Strathpeffer.

The Board are also going to build eight stone houses for their staff at Fort Augustus, where it is hoped there will be further developments by Inverness County Council. Another group of houses is to be built near Glascarnoch power station. The total number of stone houses built by the Board is now 76. All the power stations being built above ground by the Board will have masonry walls, either solid masonry throughout or on the outside face.

IN PARLIAMENT

Loans to Local Authorities

THE Opposition sought further elucidation of the Government's intentions in increasing the rate of interest for local authority borrowing from the Public Works Loan Board—announced in the Commons on February 28—when the Chancellor of the Exchequer answered questions in the House the following day.

Mr. Butler was asked by MR. BLENKINSOP whether he was aware of the strong criticism from both sides of the House at the frequent variations in the rate of interest on the Board's bills. Did the Chancellor regard this latest change in Bank rate as of a permanent character?

THE CHANCELLOR said that Bank rate was a flexible instrument, and he was sorry if its flexibility had repercussions in other spheres.

MR. HUGH GAITSKELL, his predecessor in office, asked whether the decision to increase the rate of interest for borrowing from the board was intended to discourage or diminish the extent of expenditure on capital works by local authorities.

MR. BUTLER replied that the initiative must be left to the local authorities themselves, but the intention in increasing Bank rate was that it should have a beneficial effect on the economy of the nation. He hoped it would.

MR. GAITSKELL said that the Opposition wanted to know what the Government's intention was in this matter. Was it, he inquired, part of the plan for putting matters right that local authorities should spend less on capital development?

MR. BUTLER replied: No. Local authorities should spend what they themselves think they can afford.

When the Opposition suggested that the plans for roads, hospitals and education announced recently by the Government were, in the light of the decision to increase Bank rate and the interest rate on loans, just "window dressing," Mr. Butler pointed out that they had been conceived in the national interest. It was, he commented somewhat tartly, surely in the national interest to have development of roads, hospitals and education services.

MR. GAITSKELL asked whether one of the unfortunate features of raising Bank rate was that it was likely to reduce investment.

MR. BUTLER said that that was a proposition at which the Government should look, and had looked. It was likely to affect the investment of stocks which would not be disastrous, but he would be sorry to see any action they had taken affecting long-term investment which was showing signs of improvement.

New Roads Programme

DURING a debate in the House of Lords on the Government's road and rail policy on March 2, LORD LUCAS OF CHILWORTH said that he had examined the details of the plans for road construction and improvement with great care, and confessed that in many of the projects there was more politics than sound road economics. If traffic trends continued as they were now, he argued, the roads projected by the Minister would be overtrafficked before they were completed. In about five years some of the roads mentioned in the plan for the next four years would have to be widened.

It was, he went on, useless to build motor roads from London to Birmingham if they started and finished in a congested area. It was useless to have quick moving traffic between large towns if the whole gain was to be lost within those towns. The most congested area, the biggest and most congested city in the world would only receive £18m. out of the £147m. That would not even correct that congestion. If £147m. was to be spent, and it was infinitesimal compared with what was required, on new highways, there had to be an assurance that the capital cost would be returned.

THE MARQUESS OF SALISBURY, Lord President of the Council, said that it had been estimated that road traffic in Britain would be doubled in the next 20 years, and that the Government must begin now to plan and build the essential arteries to carry it if they were to be ready in time. It was hoped that the scheme of road construction and improvement, for which £147m. would be authorised in the first four years, would not stop at the end of that period. That figure excluded expenditure on large projects of national importance, including the question of the crossing of the Firth of Forth by bridge or tube.

The great new arteries, the first of which would be from London to Rugby, would, and must, be of the most modern type based on experience gained not only in England, but in other countries overseas, otherwise they would be behind the times when they were completed. Within this framework of arteries there would be expenditure on subsidiary roads, which would be improved with money, some of it drawn from the £147m. authorised by the Government, and some from local authorities in the areas concerned. For the first four years that expenditure would be about £30m. An early completion of at least one artery of the type mentioned was essential, for it would, apart from any other result, transform the attitude of the public and local authorities on the standard of roads necessary to-day in a great industrial country like Britain, and in that way colour all future planning.

OTHER BUSINESS

HUTTED CAMP'S FUTURE

MR. JOHN HAY asked the Minister of Housing and Local Government if he would now give approval to the plan for redevelopment as a housing estate of the Field Farm hutted camp at Dorchester, Oxfordshire.

MR. SANDYS said that this development would be a substantial departure from the approved Development Plan for Oxfordshire and he had directed the county council not to grant permission for it without his authorisation while other choices were being explored.

THE ST. JAMES'S THEATRE

On February 22, MR. GEORGE JEGER asked the Minister of Housing and Local Government, what action he had now taken to prevent St. James's Theatre from being replaced by offices.

MR. SANDYS said that the London County Council recently gave planning permission in principle for the replacement of St. James's Theatre by an office building. He was informed by Mr. Prince Littler, part-owner of the site, that the application for this permission was made without his knowledge or that of his partner, and that they had no present intention of demolishing the theatre or selling the site. On the contrary, Mr. Littler assured him that he was most anxious to do what he could, consistent with the economic running of his business, to preserve this well-known London theatre.

While St. James's Theatre undoubtedly possessed character and charm, the exceptional concern which this project had evoked was not based solely on architectural considerations. Nor could it be wholly accounted for by distress at the possible disappearance of a famous playhouse with sentimental association. Behind these feelings there was, he believed, the understandable fear that, if one by one other West End theatres were similarly to disappear, London's renowned position in the world of drama would be endangered.

He had discussed this wider issue with representatives of the LCC; and they were considering what practical action was open to them, in their capacity as Planning Authority, to help safeguard the future of London's theatres.

HOUSE COMPLETIONS

CAPTAIN PILKINGTON asked the Minister of Housing and Local Government what was the average number of new houses built from 1946 to 1951 and from 1951 to 1954.

MR. DUNCAN SANDYS, in a written reply on March 1, said: An average of about 169,000 permanent houses a year was built in Great Britain from 1946 to 1951. The average for the years 1951 to 1954 was about 302,000.

HOUSING ALLOCATIONS

MR. OSWALD asked the Minister of Housing and Local Government by what percentage he had instructed his principal regional officers to cut local authority allocations in house building.

MR. SANDYS replied on March 2: None. My Regional Officers are instructed to treat each local authority's building programme individually.

FUTURE LAND REQUIREMENTS

MR. PATRICK MAITLAND asked the Minister of Housing and Local Government what was his estimate, based on the areas of land scheduled in development plans, of land likely to be required, in England and Wales, for house-building and urban development in the next 20 years.

MR. DUNCAN SANDYS, in a written reply on March 2, said: I have been most carefully considering what information I could give in reply to this question. I have reluctantly come to the conclusion that there are so many unknown or uncertain factors, that any estimate which I might give him regarding the building programme over the next 20 years would be wholly unreliable and consequently misleading.

PORT HARCOURT EXTENSIONS

MR. JOHN TILNEY asked the Secretary of State for the Colonies what programme of works, with approximate dates of completion, had been decided on for general wharf

and berth accommodation at Port Harcourt, Nigeria.

MR. HENRY HOPKINSON, Minister of State, Colonial Office, in a written reply on March 2, said that a new lighter berth, tenders for which had to be submitted by March 2, 1955, should be completed by about mid-1956. Meanwhile a temporary lighter berth had been completed. The contract drawings for the three new deep-water berths were expected to be issued for pricing next summer. The main wharf would be extended by 1,500 ft. to provide the deep-water berths and three large transit sheds and a warehouse of 20,000 tons capacity. Work should begin on the wharf extension before the end of 1955, and the whole programme should be completed by about the end of 1958.

NEW ROAD SCHEMES

On March 2, MR. MARTIN LINDSAY asked the Minister of Transport and Civil Aviation whether he would publish a table showing the progress to date of the 10 major road improvement schemes announced by him on December 8, 1953.

MR. BOYD-CARPENTER said that progress with the ten major road schemes announced by his predecessor for authorisation in the current financial year was as follows:

Cromwell Road extension. Preparatory work and land acquisition are proceeding. Tenders have been received for carrying out the work on the first part of the section for which the London County Council are responsible. It is hoped to invite tenders shortly for the first part of the trunk road section.

The Wilderspool level crossing, Warrington—provision of a bridge. Tenders for carrying out the work are being considered.

East Retford By-pass (Gt. North Road).—first part. Preparatory work has been completed. Land is being acquired.

Doncaster Mill Bridge—reconstruction and widening. Preparatory work is in hand. An objection to the draft orders made under the Trunk and Special Roads Acts is being considered.

Cavendish Bridge (A.6)—replacement of temporary bridge. It is hoped shortly to invite tenders for carrying out the work.

Markyate By-pass (A.5) Preparatory work is well advanced. Draft Orders under the Special Roads Act have been published.

Stafford-Stoke Road (A.34)—provision of three lengths of dual carriageway. Work is 75 per cent. complete.

Western Avenue (Middlesex) (A.40)—duplication of carriageways. Detailed preparation is in hand for the first section (Willesden Lane to Park Royal Station).

Loughton (Bucks) By-pass (A.5). About 15 per cent. of the work has been done.

Ashford (Kent) By-pass—completion. It is hoped that work will begin by early summer.

MORE MONEY FOR SCHOOLS

An increase of about £12m. in the total value of major projects in the school building programme for 1955-56 compared with 1954-55, was announced by the Minister of Education in the Commons on March 3.

SIR DAVID ECCLES was replying to a question by Mr. Swingler. He said that the value of the projects was now about £60m., compared with £48m. for the current year.

The Minister also stated in reply to another question that he was willing to consider proposals for building swimming baths in schools where the bath could be provided either as part of a new school within the normal cost limits or in substitution for playing fields which would otherwise be required under the regulations.

He added that twelve projects for additional technical education in Northumberland, Durham and Cumberland, were under construction, or had been approved to start before March 31, 1956. Twelve more being considered for commencement in 1956-57.

HIGH FLATS

Further Papers at the Recent RIBA Symposium

EXTRACTS are given below of papers read at the afternoon session of the Symposium on High Flats organised by the Royal Institute of British Architects, which was held at 66, Portland-place, London, W1, on February 15. In the absence of the President, Mr. C. H. Aslin, CBE, the chair was taken by Dr. J. Leslie Martin, FRIBA, architect to the London County Council. Papers given at the morning session were summarised in our issue of March 4.

Fire Protection in High Flats

MR. K. R. LACK, ARIBA, of the Ministry of Housing and Local Government, gave a paper on "Fire Protection in High Flats." He said:

Very high buildings must be designed so that there is no need for the occupants of upper floors to leave when there is a fire below them. This is a new approach to the subject—in this country, at least—and I want to concentrate on it to-day. Here there are three main principles.

The first principle is that the structure should be designed to limit the spread of the fire; the second is that the occupants in any danger zone must have a means of escaping from it; and the third is that the fire service must be able to deal with a fire expeditiously. These three principles are all inter-related.

LIMITATION OF SPREAD OF FIRE

In blocks of flats or maisonettes, this principle is necessary for three fairly obvious reasons, first to contain a fire in a limited area for sufficient time to enable the occupants in the danger zone to escape to safety; secondly to prevent the fire from getting hold on the building before the arrival of the fire-fighters; and thirdly to limit loss of property.

To achieve these three objects a building should be designed in the form of a series of cells enclosed by elements having a fire resistance capable of restraining any fire occurring within the cell.

In residential buildings, the dwelling units themselves, whether they are flats or maisonettes, provide a natural basis for cellular design. Each dwelling unit can be made into a separate cell. In addition, the main staircases and the lifts, if they are fully enclosed, will form separate vertical cells extending from top to bottom of the building.

The degree of fire resistance necessary to prevent penetration by fire of any wall or floor of a cell is related to the fire load, i.e., the amount of combustible material present in the building per square foot of floor area. For domestic buildings, the Fire Grading of Buildings Committee showed that a fire resistance of one hour is sufficient for this purpose. In high flats, therefore, the floors and walls separating dwellings from one another and from common halls or passages, and the wall enclosing the main stairs should have a fire resistance of not less than one hour. In order to prevent collapse of the building during a fire all parts of the main structural frame should also be designed with a fire resistance of one hour.

In each cell, however, certain complications are bound to arise because of the necessity to pierce the enclosing elements to provide doors and windows.

On combustible materials, Mr. Lack continued: In high flats those elements of structure which need one hour's fire resistance to prevent collapse or to contain a fire within a cell should be non-combustible. Apart from this the use of combustible materials increases the severity of a fire and, if used in the form of linings, greatly increases the rate of spread of fire in a cell. For these reasons they should generally not be used in any part of a high building.

Combustible floor finishes contribute little, if at all, to spread and severity of fire and need not be banned, except on main escape routes.

On means of escape, the speaker said: In high flats designed in the form of cells each of which is constructed to limit the spread of fire, safety can be assured by providing escape routes away from the danger zone rather than by providing for the total evacuation of a building. The conception is that escape will be from a floor which is threatened to one which is not.

CONCLUSION

In conclusion, Mr. Lack said: Some of the theories I have advanced are arguable, but in this country we have, as yet, only limited experience of very high residential buildings. As technicians we can assess the risks and make provision to meet them in terms of materials and constructions, and the way they are assembled, but we must not forget that when fire is involved, we are essentially concerned with human behaviour in an emergency.

I would add, therefore, that ultimately it is essential that tenants should receive instruction and should be made aware of what they must do in an emergency.

The Effects of Services on Design

MR. A. W. CLEEVE BARR, ARIBA, gave a paper on "The detailed design of high flats and the effect of services on design," which was intended to be complementary to that given in the morning by Mr. Whitfield Lewis [summarised in *The Builder* of March 4]. He said:

I am obliged to confine myself to an account of the effect of services on detailed design. In a few words, this is largely a matter of leaving an adequate number of holes—holes of the right size in the right place and almost invariably vertical holes from ground floor to roof. This paper would more appropriately have been headed just "Holes."

It is most important that the extent of

these holes be fully realised before the form of structure is decided upon. They tend to impose a certain discipline, particularly on bathroom-kitchen planning and, although they can quite successfully be dotted about all over the plan, there is a strong case on economic grounds for a service core, with a vertical single duct serving one or more dwellings. At no time in our work on high flats and maisonettes at the LCC have we found a need for a deep floor thickness to contain horizontal services as is the case in multi-storey hospital or school design.

"AN ANACHRONISM"

On heating, Mr. Barr said that the use of individual open fires with individual flues in high flats of 10 storeys and above is a technical anachronism. He added that a development which offers new possibilities for the use of solid fuel individual fires or stoves in high flats is the shunt flue.

I propose to say nothing, the speaker continued, about the traditional system of natural cross-ventilation of dwellings except that I am very glad to see model by-laws no longer require permanent ventilation to habitable rooms and that the LCC will now grant waivers to omit it also. Our first point flats at Wimbledon had the by-law requirement of 20 sq. ins. of permanent ventilation to each habitable room and it was soon apparent that in the top three storeys it was very difficult to keep these vents functioning and to avoid their becoming open sluices in bad weather for the inlet of wind and driving rain.

The reasons for the introduction of mechanical extract ventilation for bathrooms, wcs and internal lobbies, is not because we think it better or more positive than natural ventilation—although a strong case could be argued on these lines—but because it permits considerable economy in structure, in the planning of individual blocks and in the site layout. The actual cost of installation of the mechanical extract ventilation, including builder's works and ducting, of various tall blocks of flats now under construction by the LCC ranges from £15 to £24 per flat according to the plan.

After dealing with sanitary plumbing and refuse disposal and cold-water services Mr. Barr said, on services generally: Problems arising from the installation of the other services which I mentioned initially—gas, electricity, telephones, radios and dry fire risers, etc.—are not considerable. The main points to be borne in mind are, I think, that in a tall building every single service should be thought out in detail and shown on drawings with every hole and duct required deliberately indicated, and, secondly, that all services should be designed for rapid installation and to avoid interference with the main structure.

WEATHER EXCLUSION

In conclusion I should like to say a few words on weather exclusion—or holes in places where they are not wanted—and to summarise the experience we have gained at the LCC during this winter from the high flats already erected. The blocks I am speaking of have generally brick-cavity-clinker panel walls. The results from the brick-clad blocks may briefly be summarised as follows:—

(i) There is no doubt at all in our experience that conditions of exposure at heights of eight storeys and above are of a different order from those which one meets up to five storeys. Traditional brick cladding requires special detailing if it is to stand up satisfactorily to these conditions.

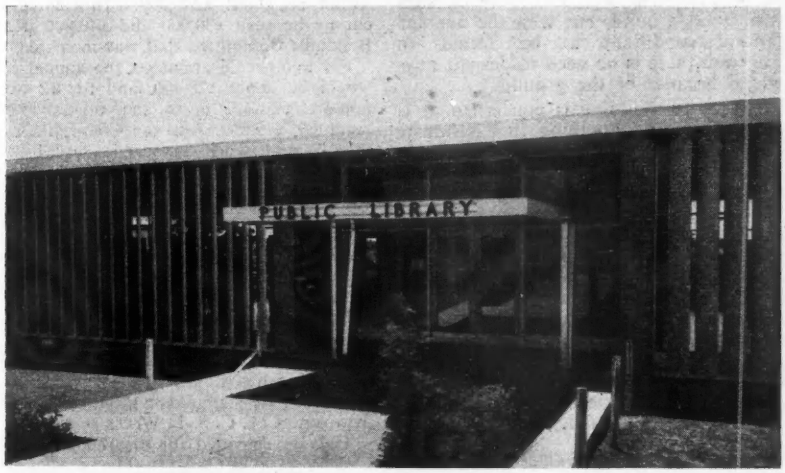
(ii) The inner face of the external skin of brick cavity walls is often very wet indeed and good detailing should include probably (a) anti-capillary grooves in the vertical side faces of concrete columns in contact with the outer skin; (b) deep dpc's at the base of the cavity draining to weep holes and adequately covering all window heads; (c) taking the dpc around the face of columns and other vertical interruptions to the cavity. A brick that breathes easily is obviously also better than one that does not.

(iii) Many holes are cast in concrete members, often the results of very careful detailed design, for a variety of purposes—bolting, shuttering together, electric conduit drops, handling precast units, etc. These can form direct paths of entry for water passing through the outer skin of brickwork unless scrupulously grouted up or stopped before completion.

(iv) Windows and doors above this height, especially inward opening types in exposed positions, need careful detailing

NEW BUILDINGS IN SYDNEY

A number of major new building and civil engineering projects have been undertaken in Sydney, Australia, since the war. The photograph (left) shows the new 14-storey Berger House, office building in Elizabeth - street, nearing completion. Shown below is small public library in the North Shore suburb of Lindfield. Engineering schemes include road and bridge widenings to ease traffic congestion.



with water bars and grooves and double rebates of the kind one would give to a house in an exposed position on the coast.

(v) Lastly, it is almost impossible to bed any facing material really solid against a reinforced concrete wall or beam. Unintentional holes formed between the outer facing skin, whether of brickwork, tiles or concrete slabbing, can be a real menace and there is no doubt that wherever water can get in it should also be let out. Under driving rain and wind, however, the water may not be able to get out quickly enough, and considerable pressures behind facing materials may be built up.

The Principles of Structural Design

MR. FELIX J. SAMUELY, MICE, MIStructE, FIAS, in a paper on "The Principles of Structural Design," said: I am aware that this meeting will not be over interested in the engineering problems as such, but more in their application to the architectural side. It is important to remember that the ultimate aim is not to put up a structure, but a series of flats which are as close as possible to the architect's original ideal. I do not necessarily believe, therefore, that the cheapest structure is always the best one. If the cheapest structure also gives the maximum harmonious living space then it is the best.

Generally speaking, there are to-day two types of structure which fit well into blocks of flats. In the first system the whole of the bearing structure is in the front and back walls, with slabs spanning from front to back. While this particularly consists of a number of columns, I consider these walls to be equivalent to bearing walls.

The second system consists of a number of cross walls. These cross walls can, again, be either solid or consist of a number of columns connected by beams, and clad with partition walls. There is no difference in the principle, and in this system the slabs span between the cross walls. There is also a third possibility, but I consider this to be rather antiquated now. It is a combination of front and back walls and a central spine wall. With the advent of prestressed concrete, this central wall has become unnecessary.

QUESTION OF COST

Of the two first systems, I would say that, overall, the second one is the less expensive, but this scheme assumes that it is possible architecturally to plan the flats in such a way that they fit easily between the cross walls. This can only be done, however, by using more space, and this additional space must be added to the cost of the structure. The difference in cost per cubic foot between the two structures will not be more than 2 per cent., so that a waste of 2 per cent. in the cube will make the first system cheaper.

The first system allows complete flexibility within a given area. It requires certain cross walls, however, for stiffening purposes against wind, at about 60 ft. to 100 ft., depending on the width and height of the building.

I have referred only to reinforced concrete and not to steelwork. In my opinion steelwork is less suitable for buildings of less than 20 storeys. In most cases the cost of the concrete casing for the steelwork is almost as much as the reinforced concrete, and the only advantage that can be credited to the steelwork is that alterations are simpler. One difficulty that almost invariably arises with steelwork is that stiffening beams are required between the columns, and these beams either project below the slab, or else make the slab unnecessarily thick. In reinforced concrete the slab can be used to stiffen the columns.

I would like to mention briefly the use of pilotti on the ground floor of high flats. This is usually introduced for one of three reasons: (a) For purely architectural considerations; (b) so that there will be no flats on the ground floor; (c) because shops, etc., are planned on the ground floor which require the columns to be further apart than in the upper floors.

There is usually more height available in the ground floor, which gives more depth for the beams over and it is usually cheaper to allow the columns to emerge organically from the plan in the upper storeys and carry them on beams at first floor level.

As the columns in the ground floor are usually larger than those above, and the beam over is heavier, it is usually better to carry these out *in situ* even if the construction above is precast.

I would like to mention here, however, that wherever it is possible a latticed precast beam is extremely economical.

FOUNDATIONS

As far as foundations are concerned, there is little that I can add to the discussion at the symposium at the Institution of Civil Engineers, i.e., that given reasonably good ground, there is no need to be afraid of the overturning moment due to wind or to the heavy loading as the weight of the construction will be sufficient to deal with this problem, and where necessary the basement can be arranged and the foundations taken deeper until the necessary weight is obtained. I will not go into details here, but will only say that, of course, it would be best to build high flats only on sites with good ground, but with the average ground conditions to be found in England, there is no need to despair anywhere because of the ground.

As far as cladding is concerned, it is difficult to find anything that seriously competes with brickwork, but large precast concrete units can be used, with an internal partition wall, that satisfy the fire proofing regulations. The only limit to the size of the precast units is the transport, and it must be appreciated that for reasons of stiffness, the larger the units the thicker they must be. However, units about 2 ft. wide that can span from floor to cill, or from floor to floor, as the case may be, have been used in several cases already, and they have the great advantage that, within the limits of the building "purse" any quality of finish can be obtained.

Structural Problems of High Flats

MR. PETER DUNICAN, AMIStructE, whose paper was on "The Stuctural Problem of High Flats" summed up his conclusions on this aspect of high flat construction as follows. In the absence, through illness, of Mr. Dunican the paper was read by Mr. Geoffrey Woods, AMICE. He said:

I believe the economic solution of this problem depends fundamentally on the architectural conception. The structure of a block at the most is about one-third of the total cost and perhaps this indicates the size of the engineer's contribution. In the ultimate, however, building is mainly a problem of material handling, and this is the special province of the contractor. Contractors have been helped considerably by the development of the tower crane, which has had far-reaching effects not only on speed but on the cost of building. I think some structures are better than others for exploitation of the tower crane. I have found that cross-wall structures appear to respond well to this line of approach.

However, as has been stated before, when it is necessary to provide high blocks local authorities should set up a construction team consisting of architect, quantity surveyor, engineer and contractor, whose task would be to produce the most economical solution to the particular problem and then to build it.

Finally, I hope I have made my points clear, but if they do not appear to be very logical I must take refuge in the fact that structural engineering is an art as well as a science.

[The remaining papers will be given in a future issue, Ed.]

KENT BUILDING WORK

County Architect's Department Proposed to be Enlarged

LESS of the work for the Kent County Council is to be done by private architects and more by the Building Department, it has been reported to the Council by the Building Committee, who say that the Council's annual building programme of about £7¾ million will probably be kept up for 10 years. If the same use is made of private architects as at present, the amount they would receive for the three years 1954-56 would be about £240,000. This could be cut by between £30,000 and £40,000 if the Buildings Committee staff was increased.

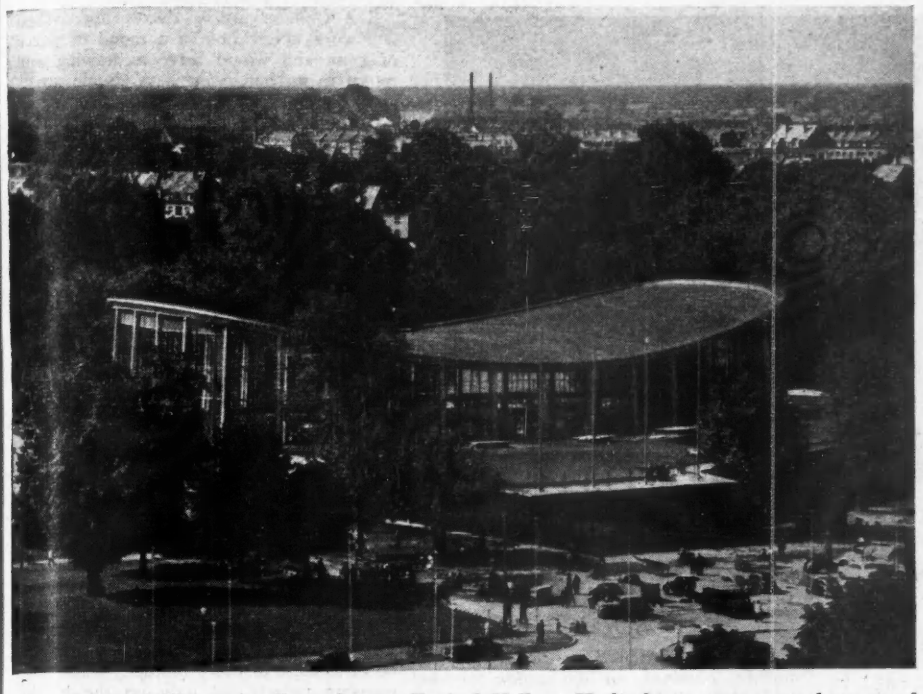
For another 26 architects the annual cost would be about £28,400, and for 12 extra non-architectural posts and others to be regraded, £19,000. Also the Committee says that if more work was carried out by the County Council they would have greater control in planning economies which would more than offset the increased cost.

The Staffing Committee have been given proposals for 12 immediate extra jobs.

CNCLLR. G. V. C. DARLEY moved the reference back of the report and said it was incorrect. He was not convinced the money would be saved.

CNCLLR. A. R. PYM seconded and wanted to know what would happen in 10 years time when the big building programme would be over. COL. C. S. F. WITTS supported.

Only seven voted for the reference back.



Situated in park-like surroundings, the new Festival Hall, at Karlsruhe, presents a novel structural appearance with its saddle-shaped roof.

A NEW GERMAN FESTIVAL HALL

First Use in Europe of Cable-Suspended Roof

BY JOHN GRINDROD, BA (COM.)

OF advanced design the new Schwarzwaldhalle (Black Forest Hall) at Karlsruhe, Germany, is claimed to be unique in Europe inasmuch as it incorporates a saddle-shaped membrane, cable-suspended roof. This is held, without any intermediate supports, by a peripheral compression belt of solid concrete supported by 36 reinforced concrete stanchions, which incline slightly inwards and which are supported by an underground horizontal concrete ring.

Awarded the first prize in a competition sponsored by the town of Karlsruhe, which called for plans for a large new festival hall which could be used for exhibition, theatrical and sports purposes, the design of the new building is by Architect Prof. Erich Schelling, of Karlsruhe. The plans also ultimately embrace an indoor swimming pool as well as sundry additional facilities.

When used as a theatre the hall is capable of accommodating 4,500 in the auditorium, while the stage can accommodate up to 1,500 persons for massed choirs and such. There are cloakroom facilities for 4,000 people, apart from stage dressing rooms. Also incorporated in the building are a foyer and box office, a restaurant and bar, toilets, and other facilities.

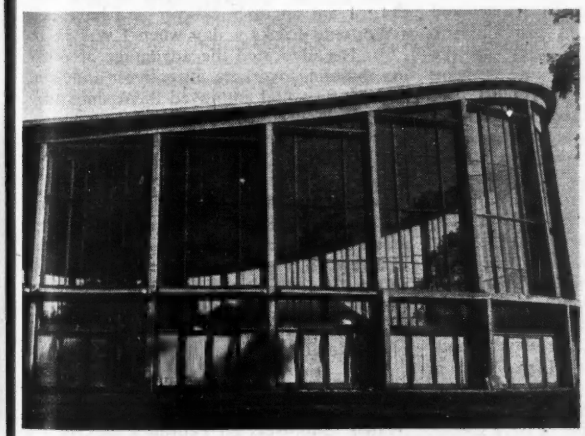
With an oval-shaped ground-floor area of about 3,200 sq. metres the hall is 73.50 metres in length and 48.60 metres in breadth, both measurements taken from the outer edge of the columns. Height to the outer edge of the length-wise axis is 17.60 metres and to that of the transverse axis 12.00 metres. The centre point of the roof is at a height of 13.20 metres, being considerably lower than the ends of the long axis but 1.20 metres higher than the ends of the short axis. This saddle-shape ellipse has the effect of draining the rainwater towards the six middle pillars of the long axis on each side.

TRANSVERSE PRESTRESSING

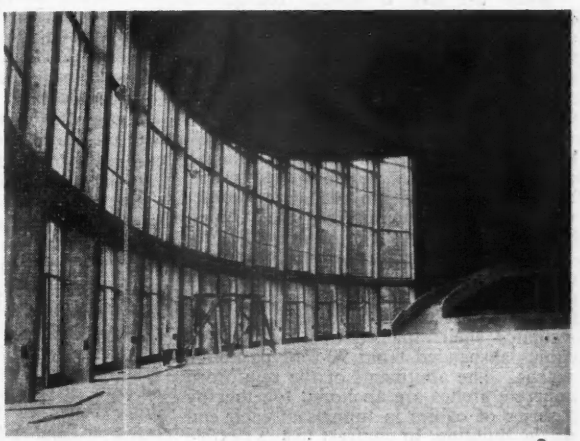
The suspension of the roof longitudinally tends to draw the binding plates together and to press the compression belt outwards. To counter the consequent flattening of the shell, prestressing in a transverse direction has been resorted to, using the Dywidag-Spannbeton-Verfahren method. Spaced at intervals of about 40 cm., this transverse prestressing reinforcement gives a tension equivalent to about 6 cm. to the shell.

For insulation purposes the roof is covered with a 3 cm. thickness of cork and a sealing layer of 'Rüsit," a bitumen coating, with inside layers of glass and jute.

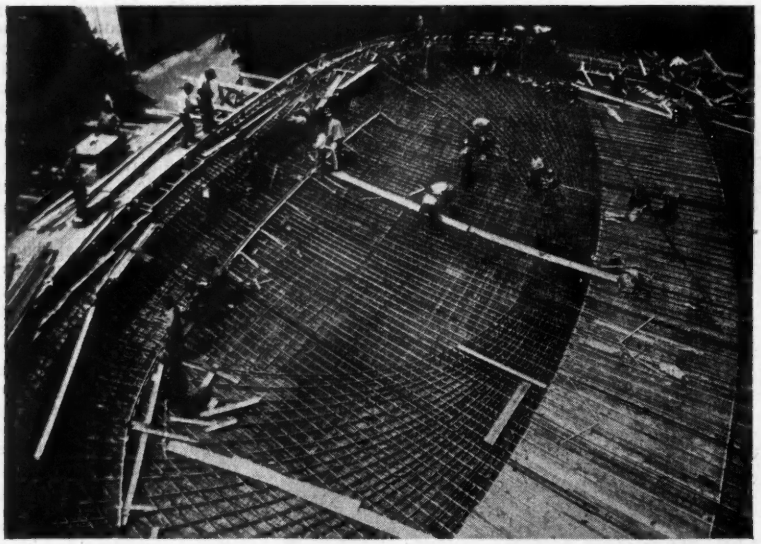
The firms Dyckerhoff and Widmann, K.G., Wayss and Freytag K.G., and



Thirty-one of the 36 bays created by the stanchions are completely glazed.



The interior of the new Karlsruhe Festival Hall nearing completion.



The saddle-shaped suspended roof of the new hall under construction.

Max Jordan Baugesellschaft mbH, were responsible for the reinforced concrete work.

Thirty-one of the 36 bays created by the supporting columns are completely glazed. The other five, on the west side, are made up with reinforced concrete. The windows, by Firma Jucho, Dortmund, are steel-framed and, consisting of a welded structure of E- and I profile, were assembled on the ground and placed in position in sizes up to 5 metres by 12 metres.

The normal steel roofing of the adjoining foyer and box-office hall is carried on outer reinforced concrete and inner tubular steel supports. It is covered with pumice concrete boards and sealed with "Rüsit."

AIR-CONDITIONING

Air-conditioning of the main hall is effected by passing heated fresh air in winter and cooled air in summer through a duct in the basement and by way of slots in the stanchions. Aerodynamically designed louvres at the highest points of the ten highest bays extract the used air.

When the hall is needed for sports events tiered ringside seating is made possible by the use of tubular steel scaffolding which can be removed when the stage is required. Because there are no intermediate columns there is excellent vision from any part of the hall.

Although the Karlsruhe Schwarzwaldhalle is claimed to be the first building in Europe with a saddle-shaped membrane roof it was preceded by a somewhat similar structure in the United States (illustrated in *The Builder* of January 29, 1954) designed as a community centre for the North Carolina State Fair at Raleigh, NC. In the American building the roof consists of a metal-asbestos, insulated shell attached to a network of cables suspended from 90-foot parabolic arches. The abutments of the reinforced concrete arches are anchored together by a series of cables in tunnels at each end of the building. In contrast to the flexible nature of the American roof, the German version is more rigid and has been given a bracing of prestressed concrete.

BOOK

⁂ *Books reviewed in these columns may be obtained on application to the Book Dept., "The Builder," 4, Catherine-street, Aldwych, WC2. Cash (which should include 1s. to cover postage and packing) should accompany the order.*

PEN AND INK DRAWING. By "Acanthus"—Frank Hoar, FRIBA. (London: The Studio Publications.) Price 15s.

CONGRATULATIONS are due to the author and publishers of this delightful book comprising about a hundred pages of quarto size reproduction of pen and ink drawings by old and modern masters. Although it is written as part of The Studio's "How to do it" series with the intent of instructing the student, it is also a book which everyone will enjoy and, as architectural subjects occupy a large part in it, it will be particularly welcome on the architect's bookshelf.

The opening chapters give brief historical notes on old masters in this medium, including Chinese, Greek, Medieval and European, and another chapter is devoted to the great architectural draughtsmen from Piranesi to F. L. Griggs. The later chapters are devoted to present-day techniques in pen and ink drawing, including such matters as the choice of paper, ink and nibs, and drawing for reproduction.

The greater part of the book is taken up with the illustrations which are well-selected examples from the old masters, *Punch* cartoons, book illustrations and advertisements, and cover a period from the fifteenth century to the present day. Each illustration carries a note made either by the author or by the artist himself, in which the technique employed by the artist, the materials he is accustomed to use and sometimes his general approach to the matter are described. For example, Rowland Emett begins his note as follows: "Ideas occur in all sorts of circumstances, and I find I can think better in fairly crowded places—cafés, etc., and ends of piers. I have special notebooks for putting down things, but usually do not have one with me when I wish to make a note."

The Chinese artists always approached any work of creation in a mood of peace of soul, and would leave a drawing and return to it after a few days. Some artists trace their drawings over and over again to obtain the desired result, whilst others, like Prof. A. E. Richardson, PRA, draw straight away without any preliminary sketching in.

Frank Hoar has included one or two examples of his own drawings done for *Punch*, together with examples of modern English and American artists. It is a book that can be thoroughly recommended.

E. F.

COSTS IN BUILDING

"Legal Charges Extortionate" Declares President

SPEAKING at the ninth annual dinner of the Evesham Association of Building Trades Employers at Evesham on February 25, MR. F. RUSSON, president-elect of the Midland Federation, said he thought that legal charges involved in house purchase were extortionate.

"We want houses built by builders, not by solicitors and financiers," he declared. "We have a duty to the public as well as to ourselves. The standard he sets should be of interest to every builder. Bad workmanship reflects not only on the builder but on the trade as a whole."

Mr. Russon spoke of the Federation's efforts to cut the cost of house building and stressed the need for building houses that the working man could afford. "I think that 25 years is the longest that is really needed for a working man to pay off a mortgage. There are many people in this country earning over £10 a week."

No part of the country had labour troubles comparable to those of the building trade in the midlands, said Mr. Russon. In that area it was the survival of the fittest. They were competing with all kinds of factories and agriculture, and factory workers were often paid up to £15 a week. Referring to an advertisement in a local newspaper, which offered top-class bricklayers £20 a week, he commented: "I don't care if a bricklayer gets £30 a week if he earns it. If a bricklayer lays 1,000 bricks a day he can, in a five-and-a-half-day week, earn about £33 and is able to pay his labourer £14. I am an ex-bricklayer and have laid a thousand bricks a day when I was 16 or 17." He advocated the advantage of offering building workers incentives and said that his firm had employed them since they were introduced in 1947. They had used them successfully on all kinds of work and no one could tell him they were impossible to operate.

Discussing the high price of building materials, Mr. Russon said that many commodities had gone up tremendously in the past few years. Two notable instances were soft wood and copper. Builders had control of only one commodity, namely labour, which comprised about 20 or 30 per cent. of the total cost of a building.

Mr. Frank Russon was elected president of the Midland Federation of Building Trades Employers on February 28. He is a past president of the Birmingham Association of Building Trades Employers and of the Birmingham Rotary Club.

CEMENT ECONOMY AND IMPROVED CONCRETE

Some Examples from a Survey of MoW "End Product" Specifications

AN investigation into the standard nominal mix specifications for concrete was ordered by Sir Charles Mole, Director-General of the Ministry of Works, with a view to improving the average quality of the concrete, economising in cement, and reducing cost by new techniques. The investigation started about four years ago, and it is now possible, states the Ministry, to review some of the results.

It was decided, at an early stage in the investigations, that the standard specifications were unsatisfactory: these usually called for a nominal mix, minimum cube strength, and frequently a definite slump, irrespective of the characteristics of the aggregates which would have to be used in any particular case.* All the points in a specification could not always be fulfilled. It was, therefore, decided to adopt a specification giving the end product required—that is, the minimum strength of the concrete, and any other requirements such as freedom from surface defects, watertightness, etc., as might be required for each particular job—leaving the contractor in each case free to design the mix to suit the aggregates available.

Specifications of this type were first introduced by the Ministry of Works in 1952, and since then over 60 contracts have been completed on which the concrete was specified in this manner. The results have been so successful that all contracts in which there is any considerable quantity of concrete now contain specifications of this type. The Ministry's Directorate of Works maintains a small section which deals with questions of concrete quality and production and advises contractors, if so desired, on the proportions which can be used in any particular case.

In general, the results show that the use of a guaranteed strength type of specification, mixes designed for workability and strength to suit the aggregates, and compaction by vibration can lead to a reduction in costs and to a definite improvement in the uniform quality of the concrete.

Below are some examples obtained by the Ministry of Works in actual practice.

REDUCTION OF CEMENT CONTENT

The reduction in the proportions of cement used has varied from about 10 per cent. in cases of hand placed concrete designed for 3,000 lb./sq. in. at 28 days, to 40 per cent. in a case of high quality concrete for prestressed work. Reductions in cement content of 15 to 20 per cent. are common when vibration is used to produce concrete of minimum 3,000 lb./sq. in. compressive strength at 28 days.

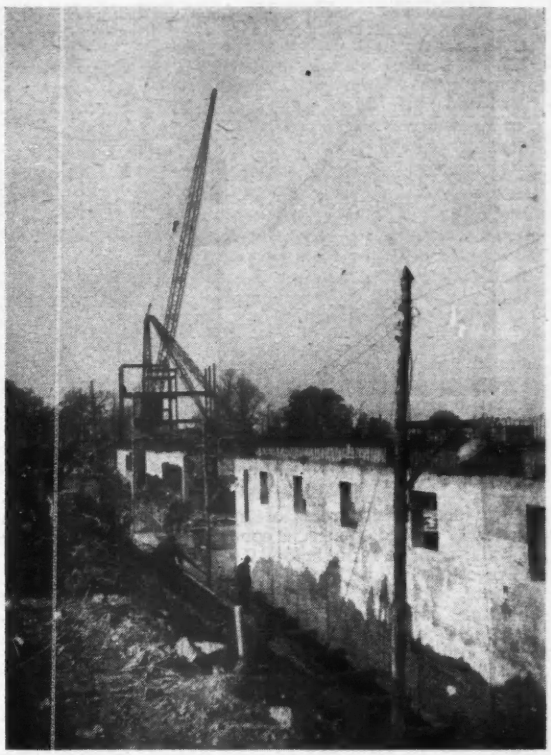
Examples showing the trend are:—

(1) (Fig. 1). A large office building with basements 500 ft. long. The whole of the concrete in these basements was of the proportion 1:2.23: 6.77 by weight using an aggregate of 1½ in. to ¼ in. The average cube strength throughout the work was 4,006 lb./sq. in. at 28 days. Required minimum strength for this work was 3,000 lb./sq. in. at 28 days and the normal mix would have been 1:2:4 by volume. As compared with this the mix actually used showed a cement saving of approximately .93 cwt./cubic yd., or 20 per cent.

(2) A number of large reinforced concrete structures have been constructed where the required strength for 28 days was 4,000 lb./sq. in. The nominal mix for this would have been 1 : 1½ : 3 by volume, but actual mixes varied from 1 : 1.87 : 4.38 by weight giving a cement saving of 13 per cent. to 1 : 2 : 6 by weight showing a saving of 30 per cent. depending on the quality of the aggregates available.

(3) In a prestressed concrete structure the design strength for the concrete in the beams and columns was 5,500 lb./sq. in. at 28 days. The mix adopted was 1 : 1.74 : 4.87 by weight, giving an average 28 days cube strength of 6,660 lb. with a saving in cement of 40 per cent. as compared with a nominal mix of 1 : 1 : 2 by volume.

Table I gives details of actual mixes used in a number of different contracts where the concrete was vibrated. To allow for variation in the materials and site supervision, the average cube strength requires to be higher than the specified minimum strength. The allowance is varied with the degree of control anticipated on each individual site.



MoW Photograph: Crown Copyright Reserved

Fig. 1. This large office building has basements 500 ft. long. The mix used showed a 20 per cent. cement saving.

OTHER ADVANTAGES

It is not always possible to obtain results as striking as those shown in the table, but savings of 15 to 20 per cent. of cement (¼-one cwt. per cubic yard) are normal. As a rule the characteristics of the coarse and fine aggregates available control the mix which can be used in any particular case.

Apart from the saving of cement the advantages obtained from these designed mixes are:—

(a) Saving of a few shillings per cubic yard in cost of materials;

(b) the production of concretes which are denser, less liable to frost damage and less liable to cracking and crazing due to shrinkage; and

(c) it is not uncommon for a properly designed mix to show better working ability than a standard mix, even though it has a lower W/C ratio.

The full advantages of designed mixes are, of course, only obtained if vibration is used, but there are similar though lesser advantages in designing mixes for placing by hand. If a concrete is to be hand-compacted it is seldom necessary to use a mix richer than 7½:1 by weight in order to obtain a minimum cube strength of over 3,000 lb./sq. in. at 28 days. Mixes of this order will show cement savings of up to ½ cwt. per cubic yard.

* In "Concrete Aggregates from Natural Sources," published in "Building Materials Digest" for October, 1954, it is stated: "Formerly there was a tendency to demand aggregates of gradings to suit a predetermined mix design; now there is a movement towards a more practical course of adapting the mix design to suit locally available materials, resulting concrete being of the same strength."

TABLE I

Site	Code of practice mix (by volume)	Specified min. cube strength at 28 days lb/sq. in.	Mix Adopted			Average cube strength at 28 days lb./sq. in.	Cement saving cwts./ cu. yd.
			Proportion by weight	Size of Aggregate in.	W/C Ratio		
12	1 : 1 : 2	5,500	1 : 1.74 : 4.87	1	.45	6,666	3.10
52	1 : 1 : 2	6,000	1 : 1.5 : 3.8	¾	.38	8,384	2.31
6	1 : 1½ : 3	4,000	1 : 2.25 : 5.78	1½	.50	5,086	1.79
7	1 : 1½ : 3	4,000	1 : 2.04 : 5.01	1½	.48	5,285	1.31
21	1 : 1½ : 3	4,000	1 : 2.0 : 6.0	1½	.45	5,691	1.79
1	1 : 2 : 4	3,000	1 : 2.23 : 6.77	1½	.54	4,006	0.93
3	1 : 2 : 4	3,000	1 : 2.45 : 6.52	1½	.51	4,607	0.93
30	1 : 2 : 4	3,000	1 : 2.20 : 6.80	¾	.56	4,319	0.93

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Fig. 2. The power float, originally used for laying granolithic paving, produces good consolidation and speeds up the process.

Fig. 3. The vibrating roller has been found satisfactory for consolidating slabs up to 8 in. thick in contact with the ground.

Provided a concrete of reasonable quality is needed (that is, a concrete with a water-cement ratio below 0.6) it will, however, usually be found cheaper to use internal vibration. A good type of internal vibrator can consolidate thoroughly over five cubic yards per hour if the concrete is properly designed. At the same time, if internal vibration is used it has been found possible and economical to use 1½ in. aggregates for work on which this type of aggregate would not be permitted by the Code of Practice (e.g., where the cover is less than 1½ in.), without any tendency to honeycombing or defective surfaces.

TECHNIQUES INVESTIGATED

In the course of the work outlined above, a number of interesting techniques have been investigated which promise material reductions in cost if the work is organised properly. These include:—

(1) The use of the power float for surface finishing.

(2) The use of the vibrating roller for consolidating thin concrete slabs, next ground.

(3) Striking shutters while the concrete is still green.

1. *The Power Float.* This machine (Fig. 2) was originally used for laying granolithic paving. It was found that the machine necessitated the use of a lower water-cement ratio and fewer fines than are used with normal hand placed granolithic, which means less laitance to cause dusting. The machine also produces considerable consolidation, resulting in a harder and more durable surface. Furthermore, the process is faster; the machine will comfortably do as much work as eight plasterers in a given time.

Where the concrete of the base slab has been vibrated, a further development has been to lay the granolithic immediately after the base slab has been compacted (that is, when the base slab is green) in which case the pressure of the machine knits the granolithic topping with the base concrete and the thickness of the former can be reduced to a nominal ½ in. or ¾ in. As the two layers have been found to be fully monolithic, the granolithic surfacing can be considered as part of the structural member and the total thickness reduced by this amount. Laid in this manner there is no possibility of the granolithic surface lifting, and results of tests have shown that there is no tendency to crack away from the base concrete under load.

Later work has shown that the machine can be used for producing a finished surface on any ordinary concrete slab, and it has in fact been employed to finish off concrete of which the aggregate was 1½ in. down and the aggregate cement ratio 9:1.

2. *Vibrating Roller.* The poker type of vibrator is is not suited to the consolidation of thin concrete slabs and a search has been made for more satisfactory methods. The vibrating roller (Fig. 3) has been found satisfactory as a means of consolidating slabs made in contact with the ground up to 8 in. thick, and over a wide range of mixes provided that the concrete mix is properly designed. Full consolidation throughout the thickness of the slab has been obtained with lean dry concrete of an aggregate cement ratio of 16:1, and the crushing strength of 6 in. cubes cut from this slab was over 2,000 lb./sq. in. at 28 days.

With richer mixes (AC ratio of the order of 8:1) core strengths of over 5,000 lb./sq. in. at 28 days have been obtained regularly, so that in cases where the strength of concrete is the determining factor, it has been found possible to reduce slab thicknesses. Slabs normally designed 6 in. thick have been reduced to 5 in., and where the power float has been used in conjuction with the roller, slabs originally 6 in. thick including a granolithic topping are now made 5 in. thick including ½ in. granolithic surface.

3. *Early Striking of Shutters.* Using a properly designed vibrated concrete it has been found possible to strip shutters at about two hours after placing. It is possible to strip much earlier than this, but because of the liability to casual damage this is not considered desirable. Provided the shutters have been suitably designed for this purpose, any shuttering can be stripped at this stage unless there is a pronounced overhang.

The advantages which can be obtained from early striking are as follows:—

(a) The exposed surfaces can be prepared for early treatment while green. If a smooth finish is required it is only necessary to rub down with a wooden or steel float, when a surface equal to a rendered surface can be obtained, whilst if a plastered finish is required for any reason (e.g., acoustic properties) the surface can be washed off with a fine spray of water giving a perfect key for the plaster without any hacking. Again it is possible to wash off the surface in such a way as to leave an effective finish by exposing the aggregate. See Fig. 4.

(b) Joints, both vertical and horizontal, can be washed off with a fine spray of water, leaving the aggregate fully exposed to provide a perfect key.

(c) Less damage is done to the shutters during the operation of striking, and shutters can easily be cleaned.

(d) If the work is such that the shutters can be used repeatedly, the amount of shuttering required for the whole job is considerably reduced. One case is known of a contractor who has consistently cast two columns 10 ft. high, each day from each of his forms.

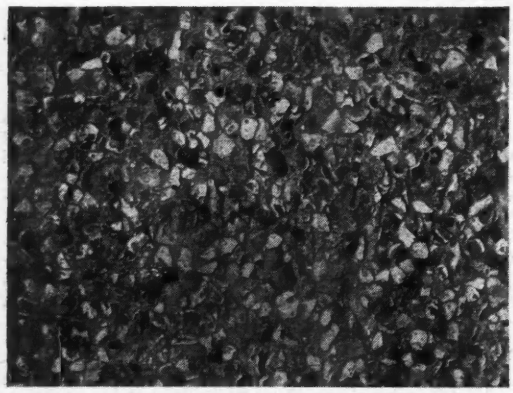

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Fig. 4. With an early striking of shutters, it is possible to wash off the surface so as to expose the aggregate as an effective finish.

Some Problems Facing the Industry To-day

AN ADDRESS BY SIR THOMAS BENNETT

SIR THOMAS BENNETT, KBE, FRIBA, addressed members of the Federation of Master Builders at the annual luncheon of the London Region held in the Connaught Rooms, WC2, on March 4. We give the following account of Sir Thomas's remarks:—

We are all concerned at the fact that the Press constantly refers to the inefficiency of our industry and makes similar derogatory remarks. From the point of view of the building contractor the short, quick and universal answer is that he is quite unable to build without any drawings and, in general, architects only produce these drawings after the building is up or at least so late in the day that he is quite unable to keep his contracts up to time.

This comment is very largely true so far as it concerns some contracts, but you would probably be astonished at the number of clients who bring me large and important sites with vague and uncertain requirements and ask when it is possible to put a contractor on the ground with full plant and equipment, and in certain cases informing me that they have come to provisional agreements with the contractor and that he will be commencing the erection of his crane on Monday week.

In the meantime I have to cope with town planning requirements, local authorities, surveyors to the London Estates, the Fine Art Commission, the Building Act, the drainage laws, constructional engineers, gentlemen who deal with boilers, to say nothing of ascertaining the availability of bricks, cement, stone and other materials which are in short supply.

THE STARTING DATE

It is almost useless for the purist to say that a leading architect can firmly tell his client that he cannot commence building operation for nine months or a year and that a builder cannot start work until he has a full set of drawings, and a priced bill of quantities.

We are great spenders of the public's money. Even the purchase of the site involves substantial outlay and it is not surprising, therefore, that even if the client is not so unreasonable as to demand possible construction within a matter of a few weeks or a month, he does constantly demand commencement at an earlier date than perfect organisation would suggest.

The outstanding fact brought to light by these conditions is the urgent need for the co-operation of all the sections of this industry and some mutually constructive way in which the initial difficulties can be bridged.

In practice I have found that with certain clients and certain contractors, agreement can be reached on the employment of the major sub-contractors and by limiting the number of drawings which must be made before the main contractor can commence, a very reasonable and proper measure of organisation can be produced out of what otherwise would be a very ragged start. In other words a high standard of organising capacity is demanded from both the architect and the builder.

ORDERING MATERIALS

Let us pass on to another aspect of this frightful story. We are told that we do not know how to order our materials. This is perfectly true. Ordering materials is a highly skilful operation. I have seen quite a number of order schedules which say:—

To Messrs. A.B.C.

We are going to order our cement from you.

Yours truly,
Messrs. X.Y.Z.,
Contractors.

You notice no date, no total quantities, no schedule of deliveries, no nothing.

I once invited Sir Malcolm Stewart to lunch to discuss this anomaly of cement ordering and he told me that he had made the business of the Cement Marketing Company by encouraging the building industry to think that it could have cement at any time, in any quantity and in any part of the country by merely making a telephone call. Those were times of surplus and of unemployment.

There is a tremendous contrast to-day with no surplus and full employment, and I cannot see how the industry can fulfil its obligations without accurate forecasts of total quantities of materials required, reasonable forecast of the date at which it is wanted and very careful ordering and delivery arrangements throughout.

We have in the building industry a very useful fellow called the general foreman. Large firms of contractors instal their elder sons in this key position and then give him two or three general foremen as assistants to make sure they can get the work done.

The general foreman, as I see it, is one of those invaluable people who make immense quantities of bricks without any straw and provide, in theory, very large profits for the contractor by so doing.

BUILDERS' "LOSSES"

Of course, I know that it is the universal opinion of contractors that they never make a profit. At least that is what I am told when I am personally brought into the settlement of a final account. It is surprising what some contractors manage to buy out of their losses, not excluding cows and pigs, but it all comes back to the fact that the profit is largely made by the general foreman.

Now, there was a time when the general foreman was satisfactory if he was a sort of qualified craftsman. In those days time and cost were largely immaterial, but when the industry split into a multitude of sub-contracting firms, the drawings generally late, as I have indicated, the country infested with various kinds of Acts of Parliament and officials, architects who criticised other architects and quantity surveyors, it is not surprising that the education, training, calibre and character of the men of to-day who fill the office of general foremen has changed out of all recognition.

Indeed, he has changed so much and so rapidly that the industry finds great difficulty in finding the right type of men to fill this onerous and important position. I think we must all accept the fact that somehow or other this extended field of education must be provided.

An intelligent, technically equipped expensive man must in future fill this post and one of the means of raising the standard of operation in the industry is to see that such men are found in sufficient numbers and at no distant date.

WAGES AND ABILITY

We have another problem of magnitude which faces us and that is wages of the workmen. It is, of course, obvious in the opinion of builders that all workmen are paid too much and the quantity of work produced too small. At the same time, it must be remembered that in 1939 25 per cent. of the skilled men in our industry were unemployed and we were working with 75 per cent. of the best.

We, therefore, now have more men with a lower average level. The average output of work is less. On the other hand this applies throughout the country. We are neither better nor worse than other industries and the solution of the problem lies with managements.

There is also another aspect of the wages problem and that is that the wages are too low. If we believed in high wages, in the course of time we should attract into the industry a more intelligent, more industrious, more energetic man and it might well be that he would produce more work and justify still higher wages. It is a terrifying spiral but worth thinking about.

In America the basic wage is £1 an hour and a bricklayer earns between £40 and £50 a week. But men know this before they join the industry. The result is that most of them are worth the money they earn. By not advertising our high wages in this country we are tending to recruit a less intelligent and capable man, less well trained, and then to pay him by means of output which results in a wage that is probably higher than his real value.

This wage business, I therefore think, needs a good deal of thought of a serious nature which not only tries to settle its short-term and urgent problems but has real regard to long-term recruiting and even such relatively theoretical considerations as the type of man that they will recruit.

SUB-CONTRACTORS

Here, therefore, are a few of the problems which beset the industry today, and, going back again to the theme with which I started, the architect with no drawings and possibly no staff who includes in his

contract a lot of things like reinforced concrete, electricity and heating (about which he knows very little), we have still the most serious problem of all—that of the co-ordination of a big mass of sub-contractors under the guidance of one capable master builder. And so we come back to consider the role which probably most of you at this luncheon here to-day fulfil in building—that of administration and management. The wheel of fortune has made you much more the drivers of a team. It has made you the organisers, the controllers, the administrators, call it what you will, of a large number of people carrying out separate portions of the work.

It seems to me that whatever number of small sub-contractors I specify, most builders manage to find a good many more that I did not think of and, unfortunately, if I do not specify the main ones I am too often presented with small and obscure firms whose names I have never heard of previously and I have to rack my brains until the magic words "low cost" come to mind and I try to disabuse my mind of the thought—"probably low tender and low standard of work." I am sure this is an exaggeration of the position, but it does not alter the fact that everyone here is presented with the task of the highest organisation and standard possible, whether his business employs 6,600 or 6,000 men.

PRESIDENT ELECTED

Mr. W. A. Mackridge, MIOB, was elected president of the London Region, Federation of Master Builders, for the coming year.

HOUSING PROGRESS REPORT

Figures for January

THE HOUSING SUMMARY presented to Parliament as a White Paper* jointly by the Minister of Housing and Local Government and the Secretary of State for Scotland shows that the number of permanent houses completed in Great Britain during January was 20,967, compared with 24,595 in January, 1954.

MoW WINTER LECTURES

Programme for April

LECTURES to be given during April in the Ministry of Works winter season of discussion-lectures on subjects of interest to the building industry are as follows:—

April 1.—"Problems of Plastering & Rendering," by E. L. Westbrook, Research Dept., George Wimpey & Co., Ltd., Bransty School, Whitehaven. 7 p.m.

April 6.—"Essentials of Good Concreting," by E. E. H. Bate, CBE, MICE, Chief Works Engineer, MoW, King's College, Newcastle-upon-Tyne. 7 p.m.

April 12.—"Copper In Building," by E. Carr, AMIMechE, AMPI, Copper Development Association, Cambrian Hall, County Offices, Aberystwyth. 7 p.m.

April 13.—The above lecture will also be given at the Main Hall, Guildhall, Cardigan. 7 p.m.

April 14.—The above lecture will also be given at the Trafalgar Institute, Charles-st., Milford Haven. 7 p.m.

April 20.—"Small Heating and Ventilating Installations," by E. W. Herrington, AMIMechE, AMIHVE, Senior Engineer, MoW, at the Cambrian Hall, County Offices, Aberystwyth. 7 p.m.

April 21.—"New Timbers for Carpentry and Joinery," by D. H. Carstairs, Regional Officer of the Timber Development Association (Western Region), Lecture Room, The Free Library, Dolgelly. 7 p.m.

*Cmd. 9403. Housing Summary, January 31, 1955. HMSO, price 2d.

NEW POWER STATIONS

[From a Correspondent]

THE British Electricity Authority are planning a number of large power stations to be erected in various parts of the country. Nearly £500m. will be invested in these stations, all of which will have some turbines working by 1960.

At Belvedere, near Erith in Kent, a 480,000 kw. station will be built at a cost of £30m. The drawings have been completed by the construction branch of the Generation Division of the Authority. No contractor has, as yet, been named. In the South-Eastern Region, at Northfleet, a 720,000 kw. station is to be built at a cost of about £45m. No plans have been prepared for this station and no firms yet appointed for the various stages of the work.

In the Southern Region a £30m. station of 480,000 kw. is to be erected at Marchwood, near Southampton. The firm of Messrs. Farmer and Dark, of London, are the architects and the construction is in the hands of Sir Robert McAlpine and Son, Ltd. The cladding of this station will be in aluminium.

At Little Barford, in the Eastern Region, a second power station is to be built, which will be a smaller one of 120,000 kw., to cost around £7½m. The project is in the early stages and no consultants have yet been appointed. In the same region, near Yarmouth, at South Denes, a 240,000 kw. station is to be built at a cost of about £15m. The building has been designed by C. A. Smeed. Contractors have not yet been appointed.

BRITAIN'S BIGGEST STATION

In the East Midlands, at High Marnum, the biggest power station in Great Britain will be erected. It will have an output of 1m. kw. and is to cost about £60m. This station is still being discussed and is not yet in the design stage. At Staythorpe, in the same region, a 360,000 kw. station is to be built by Balfour, Beatty and Co. at a cost of £25m.

In the North-Eastern Region, at Blyth, another gigantic 1m. kw. station is to be built at an approximate cost of £60m. The scheme is at a very early stage of development and appointments have not yet been made. At Willington, near Derby, a 400,000 kw. station is to be built at a cost of £30m. This will be the first of two stations to be erected in this area. Farmer and Dark are the architects; Ewbank and Ptnrs. the consulting engineers, and the contractors are Marples, Ridgway and Ptnrs., Ltd. Rugeley, in the Midlands, is to have a new 540,000 kw. power station to cost about £35m. The design and engineering consultation is being undertaken by the construction branch of the Generation Department of the Authority.

South Wales is to have two power stations; one at Aberthaw and another at Rogerstone. The larger one will be at Aberthaw, a £35m. station of 540,000 kw. Rogerstone's station will be comparatively smaller, about 120,000 kw. and the cost will be £7m. The consulting engineers are Kennedy and Donkin.

Three new stations are also to be erected in Yorkshire: Elland is to have a 180,000 kw. station to cost about £11m.; and one is to be built at Ferrybridge. The latter is a 300,000 kw. station to cost £20m. The architects are Watson and Cotes and the contractors Higgs and Hill. A third station is to be erected at Skelton Grange, and the consultants for this project are Merz and McLellan. It will be a 360,000 kw. power station to cost about £25m.

Scotland is to have a power station built at Kincardine in the South-East. It will be of 720,000 kw. with an estimated cost of about £58m. The consultants are Kennedy and Donkin.

OBSTACLES TO GREATER PRODUCTION

Importance of Winning Employees' Confidence

SPEAKING in London on February 25, MR. ALLEN W. RUCKER, president, the Eddy-Rucker-Nickels Company, management consultants, of Cambridge, Mass., said that as a visitor in the United Kingdom he was profoundly impressed by a number of things, including the new spirit and the new leadership in thought and action that he found here.

"From figures available to me," said Mr. Rucker, "I estimate that in the year 1954 your overall productivity rose well over four per cent. Perhaps that rate cannot be sustained year after year; but supposing only that you average the three per cent. American rate. The scale of living here would advance somewhat as follows: in five years, by 1960, by 16 per cent; in ten years, by 1965, 34 per cent.; and in fifteen years, by 1970, 56 per cent. From what I have seen of industries here I believe these figures can be surpassed.

"In America, our manufacturing industry grows in volume at the rate of slightly over four per cent. yearly, compounded. What does it mean? It means that our manufacturing output doubles in every 18 years. It means that during the normal business lifetime, say 35 to 40 years, a business executive may look forward to retiring from a business that is four times as large as when he entered it as a young man."

The possibilities were no less attractive for young men in all ranks of industry. Real wages in any country rose in exact proportion to the improvement in productivity. Starting in at the bottom at, say, age 20 years, an average worker, even without any individual promotion, could expect to be making a real wage of almost four times his starting wage when he retired at age 65 years.

"It is not difficult to imagine what you, in your own individual business, could obtain from your employees in added co-operation and output if a similar prospect could be put before them," Mr. Rucker continued.

"What holds us back from this? It is the constant, incessant, and depressing idea that industry makes money out of labour, not with labour. It isn't so here nor in the United States and Canada. But altogether too high a percentage believe it to be so. Are we not always talking of 'labour saving,' of cutting labour costs, of the evils of higher wages? Do not our business publications advertise pages of devices, gadgets, and equipment for 'saving labour'?

The interests of labour and management were not antagonistic, Mr. Rucker added. They were one and the same—more production, more total wages and more total management income. This same principle applied to individual firms no less than to the economy as a whole.

The Builder

CURRENT PRICES OF MATERIALS

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchants warehouse will necessarily be higher so as to include the stocking and handling costs involved. Due to the exceptional circumstances now prevailing it is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

		£	s.	d.
Pit Ballast	per yd.	1	3	10
Pit Sand	„	1	2	11
Washed Sand	„	1	4	5
¾ in. Shingle	„	1	0	9
¾ in. Broken Brick	„	1	0	0
Pan Breeze	„		10	3
Fine or Coarse Foamed Slag Aggregate ... ... 2 yds. of fine and 2.6 yds. of coarse per ton	per ton	3	0	9

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

		£	s.	d.
Best British Portland Cement. Standard Specification delivered Charing Cross area.				
6-ton loads and upwards, site	per ton	4	16	6
1 to 6 tons, site	„	5	5	6
Rapid Hardening Cement in 6-ton loads and upwards to site	„	5	4	6
1 to 6 ton do. site	„	5	13	6
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.				
Red, Buff or Khaki Colorcrete in 6-ton lots ... Other colours according to colour.	„	6	18	0
In 4-ton lots from 211s. 9d. to 435s. 9d. per ton.				
White Portland Cement	„	12	17	0
Under 1 ton	per cwt.		15	4
417 Cement (Ultra Rapid Hardening) in 6-ton lots and upwards	per ton	6	9	0
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.				
Cullamix Tyrolean Finish, £9 4s. 3d. to £10 17s. 9d. (1-ton loads and upwards).				
Lightning and Ciment Fondu Brands High Aluminous cement, 6-ton lots and up	„	14	0	9
Stourbridge Fireclay, 6-ton loads at Railway Depot, London	„	6	2	3

BRICKS

		£	s.	d.
Full Loads.				
First Hard Stocks	per 1,000	11	7	0
Second Hard Stocks	„	10	11	0
Mild Stocks	„	8	16	6
All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.				
2½ in. Nominal Fletton Bricks to sites in W.C.				
District Commons	„	5	13	0
Cellular do.	„	5	13	0
Keyed do.	„	5	15	0
Rustics	„	6	18	0
Cellular Rustics	„	6	18	0
Single Bullnose do.	„	6	13	0
Sandfaced	„	7	13	0
Best Blue Pressed Staffs (London Stations) ...	„	24	19	6
Do. Bullnose (London Stations)	„	25	13	6
Blue Wire Cuts (London Stations)	„	22	11	0
Midhurst Lime Bricks (London Sites)	„	10	3	0
Uxbridge Whites (London Sites)	„	9	1	6
Special Purpose Sandlime Bricks (London Sites) ...	„	7	14	0
2½ in. Best Stourbridge Fire Bricks (London Stations)	„	24	6	0
3 in. do. (London Stations)	„	29	3	3
2½ in. Machine - made Sandfaced Red Facings (London Sites)	„	13	19	6
2½ in. Machine-made Multi Red Facings (London Sites)	„	14	4	6
2½ in. Hand-made Sandfaced Red Facings (London Sites)	„	14	11	0
2½ in. Hand-made Sandfaced Multi-Colour Facings (London Sites)	„	14	11	0
Hand-made Sandfaced Cherry Red Facings. Berkshire district (London Sites)	„	17	5	6
Hand-made Sandfaced Multi-Colour Facings. Berkshire district (London Sites)	„	17	5	6
Rubber Bricks for gauged arches (London Sites) ...	per 1,000	41	10	0
2½ in. Surrey Clamp Burnt Multi Stock Facings (London Sites)	„	13	6	0
2½ in. Surrey Kiln Burnt Multi Stock Facings (London Sites)	„	14	4	6
Glazed Bricks (London Sites), White, Ivory, Brown—				
Stretchers	„	64	0	0
Headers	„	63	0	0
Quoins, Bullnose and 4½ in. Flats	„	80	0	0
Double Stretchers	„	85	0	0
Double Headers	„	77	10	0
One side and two ends	„	87	0	0
Two sides and one end	„	89	10	0
Splays and Squints	„	83	0	0
Cream and Buff £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 7½% for Best quality and plus 7½% less 10% for Second quality.				

PARTITION SLABS, etc.

Delivered Central London Area.

	Minimum lorry loads.		£	s.	d.
Hollow Clay Partition Blocks (Keyed)					
*2 in.	140 yds.	per yd. sup.		4	3
*2½ in.	140 yds.	„		4	6
*3 in.	120 yds.	„		5	2
Building Blocks (Keyed)					
*4 in. (6 cavity) ...	95 yds.	„		6	7
6 in. (8½" × 5⅛") ...	1250 Blocks ...	per 1000	25	14	0
*Half blocks at no extra charge.					
Clinker Concrete					
2 in.	100 yds.	per yd. sup.		3	7
2½ in.	85 yds.	„		4	2
3 in.	75 yds.	„		5	0
4 in.	55 yds.	„		6	2
Cranham					
2 in.		„		6	8
2½ in.		„		7	4
3 in.		„		8	7
4 in.		„		10	7
4½ in. Load bearing quality		„		11	8
Floor Blocks and Filler Tiles					
3 in. Floor Blocks 12 in. by 12 in. delivered in full lorry-loads		per 1,000	32	11	0
4 in. do.		„	34	18	0
5 in. do.		„	41	11	0
6 in. do.		„	46	16	0
7 in. do.		„	56	18	0
8 in. do.		„	66	14	0
10" × 3" × ¾" Filler Tiles in multiples of 10 tiles		per 1,000 multiples	56	2	0
12" × 3" × ¾" do.	do.	„ „	63	17	0
10" × 4" × ¾" do.	do.	„ „	69	14	0

STONEWARE DRAIN PIPES, etc.

The following are the percentages to be added to the Standard List prices delivered London Area.

	Over 2 tons	Over 100 Pieces under 2 tons	Under 100 Pieces under 2 tons
Best Quality	+67½%	+97½%	+107½%
B.S.S. Best do.	+10% +67½%	+10% +97½%	+10% +107½%
Tested Quality	+37½% +67½%	+37½% +97½%	+37½% +107½%
B.S.S. Tested do.	+47½% +67½%	+47½% +97½%	+47½% +107½%

		£	s.	d.
3 in. Land Drain Pipes (in 12 in. lengths)	per 1,000	10	13	6
4 in. do.	„	14	2	0

STONE

		£	s.	d.
Bath Stone—				
Monks Park	per ft. cube		7	10
St. Aldhelm Box Ground	„		8	10
Delivered in railway trucks at South Lambeth B.R. Western Region				
Doulting Stone Random Blocks. Delivered London area	„		8	7
Beer Stone. Delivered London area	„		8	0
Portland Stone—				
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region	„		8	1½
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.				
9 in. × 3 in. Rubbed, weathered, throated and stooled cills	per ft. cube	3	4	3
12 in. × 6 in. do. do.	„	2	6	0
12 in. × 3 in. Plain coping, twice throated ...	„	1	15	4
12 in. × 3 in. Weathered and twice throated coping	„	2	7	4
14 in. × 6 in. do. do.	„	2	2	8
4½ in. × 9 in. Plinth, rubbed on top and face ...	„	1	18	1
3 in. sawn two sides Slabs, random sizes	per ft. sup.		6	9

STONE—*continued*

		£	s.	d.
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ...	per ft. cube	1	3	5
Do. do. fair one edge for fair faced brickwork		1	7	10
Hard York—				
12in. × 2in. Square Steps, rubbed on top and edge	per ft. run		8	2
14 in. × 3 in. Round-nosed Steps, rubbed on top and front	per ft. cube	2	3	8
12 in. × 6 in. Plain Steps, rubbed top and front ...	„	1	18	3
2 in. Rubbed and Jointed Paving, given sizes ...	per ft. sup.		7	10
2 in. Sawn Paving, edges squared, in random sizes	per yd. sup	2	13	10

TILES and PANTILES

Delivered London area by road in 6 tons or over per 1,000

	£	s.	d.
Machine-made Pantiles and French pattern Tiles from Lincolnshire district	29	8	0
Hand-made Pantiles Berkshire district	47	10	0
Hand-made Double Roman Bridgwater district	58	13	6
Hand-made 10½ × 6½ tiles Berkshire district	13	1	9
Machine-made 10½ × 6½ Staffordshire district	13	8	9
Hand-made Hip and Valley tiles per doz.	1	8	9
Machine-made Hip and Valley tiles do.	1	6	6
Concrete tiles 10½ × 6½	7	14	6
do. Interlocking (49S)	18	9	6

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual

24 × 12	113	0	4
22 × 12	93	16	0
22 × 11	84	15	0
20 × 12	79	19	6
20 × 10	74	12	0
18 × 10	53	18	9
18 × 9	47	5	6
16 × 10	44	7	0
16 × 8	34	10	6

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

				£	s.	d.
Softwood—						
Joinery quality	Ex. Wharf	per standard		£110 to £130		
Carcassing quality	do.	„		£95 to £100		
1 in. Tongued and Grooved Flooring	do.	„		£106	0	0
Hardwood—						
Mahogany—African S.E. ...	do.	per ft. cube		1	5	0
do. Honduras do. ...	do.	„		3	5	0
Oak European do. ...	do.	„		2	2	6
do. Japanese do. ...	do.	„		2	10	0
do. English Logs sawn	do.	„		1	10	0
Teak 8 in. average S.E.	do.	„		3	5	0
Walnut African Logs sawn	do.	„		1	1	6

DOORS (in Lots I-II)

Delivered London area.

1½ in. 4 Horizontal Panel Pattern 4 in. deal			
2 ft. 0 in. × 6 ft. 6 in.	each	1	12	0
2 ft. 3 in. × 6 ft. 6 in.	„	1	13	0
2 ft. 6 in. × 6 ft. 6 in.	„	1	14	0
2 ft. 9 in. × 6 ft. 6 in.	„	1	16	6
2 in. do. but top panel open. Pattern 4 × G in deal				
2 ft. 6 in. × 6 ft. 6 in.	„	2	9	0
2 ft. 9 in. × 6 ft. 6 in.	„	2	11	6
2 in. Panel, top panel open. Pattern 2 × G in deal				
2 ft. 6 in. × 6 ft. 6 in.	„	2	1	9
2 ft. 9 in. × 6 ft. 6 in.	„	2	3	6

SUNDRIES

Delivered London area

1 in. Wood Wool Slabs, 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton)	per yd.	5	8	
1½ in. do. (67 yds. to 1 ton)	„	7	4	
2 in. do. (52 yds. to 1 ton)	„	8	11½	
2½ in. do. (45 yds. to 1 ton)	„	10	3	
3 in. do. (39 yds. to 1 ton)	„	11	5½	
Quantities under 1 ton add 1d. per ½ in. of thickness.				
½ in. imported insulation Board, quantities over 5,000 sq. ft.	per 100 sq. ft.	2	2	6
¼ in. Hardboard do.	„	2	1	6
⅛ in. do. do.	„	3	2	6
½ in. Asbestos Flat Building Sheets	per yd. sup		3	2
Roofing Felt, 1-ply	„		1	6
do. 2-ply	„		1	9
Best Scotch Glue, in slabs	per ½ cwt.	5	0	0
do. pearl	„	5	5	0
Croid Glue	28 lb.	2	6	0
Cut Nails 3 in. (1-ton lots)	per ton	58	5	0
do. 4 in. and up (1-ton lots)	„	54	15	0
Wire Nails, 3 in. (4-cwt. lots)	per cwt.	2	16	3
do. 4 in. and up (4-cwt. lots)	„	2	12	9

METALS

STEEL JOISTS, ETC.

Basis Joists—			
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in. 12 in. × 6 in. plain cut to lengths delivered London area	per ton	38	11	6
Extra for sizes				
3 in. × 1½ in., 4 in. × 1½ in.	„	3	10	0
3 in. × 3 in.	„	2	10	0
4 in. × 3 in., 10 in. × 4½ in.	„	1	10	0
5 in. × 2½ in., 5 in. × 3 in.	„	1	15	0
4½ in. × 1½ in.	„	3	5	0

5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. ...	per ton	15	0
6 in. × 3 in. 24 in. × 7½ in.	„	2	0	0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in. ...	„	1	5	0
9 in. × 4 in. 10 in. × 5 in.		1	0	0
12 in. × 5 in. 22 in. × 7 in.				
9 in. × 7 in. 10 in. × 8 in. 12 in. × 8 in.				
14 in. × 5½ in. 14 in. × 6 in. 14 in. × 8 in.				
15 in. × 5 in. 15 in. × 6 in. 16 in. × 6 in.	„		10	0
16 in. × 8 in. 18 in. × 6 in. 18 in. × 7 in.				
18 in. × 8 in. 20 in. × 6½ in. 20 in. × 7½ in.				
Steel angles average price	„	40	5	0
Steel tees average price	„	41	5	0
Fabricated work delivered London—				
R.S. Joists cut and fitted	„	54	0	0
Compound girders	„	59	0	0
Stanchions	„	64	7	6
Compound stanchions	„	67	15	0
In Roof Work—Trusses and Purlins	„	80	0	0
Average prices not for awkward work.				
Mild Steel Ferro-Concrete bars to BSS785 ex London				
Stock ¾ in. diam., and upwards	„	40	6	0
¼ in. diam.	...per ton extra	4	7	0
⅛ in. do.	„	3	7	0
⅜ in. do.	„	2	9	6
½ in. do.	„	1	12	0

MILD STEEL TUBES

Tubes to BSS1387 and Fittings. List prices and following discounts:

Galvanised Tube—	W.I. Fittings	Malleable Fittings
Class A NET		
Class B + 9½%	Light + 24½%	Malleable List — 35% + 40%
Class C + 25½%	Heavy + 32%	
Black—		
Class A — 21½%		
Class B — 11%	Light + 11½%	Malleable List — 35%
Class C + 1½%	Heavy + 19½%	

C.I. HALF-ROUND GUTTERS

Delivered London per yd. in 6-ft. lengths

	Gutters	Nozzles	Stop Ends
3 in.	3/3½	2/11	/10
3½ in.	3/7	3/2	/10
4 in.	4/7½	3/7	1/3
4½ in.	5/1	4/–	1/6
5 in.	5/8	4/4	1/9

C.I.O.G. GUTTERS

3 in.	4/3	3/10	1/–
3½ in.	4/9	3/10	1/3
4 in.	5/3	4/–	1/6
4½ in.	5/8	4/7	1/9
5 in.	6/2½	5/3	2/–

C.I. RAIN-WATER PIPES

Per yd. in 6-ft. lengths	Pipe	Bends	Branches
2 in.	7/0½	3/7	5/2
2½ in.	7/0½	4/–	6/11
3 in.	7/11	5/–	7/6
3½ in.	9/–	5/11	9/–
4 in.	10/5	7/2	10/8

L.C.C. COATED SOIL PIPES

2 in.	8/–	6/2	7/6
2½ in.	8/5	6/10	9/4
3 in.	9/5½	7/6	11/1
3½ in.	10/7	9/4	12/11
4 in.	12/0½	10/5	15/3

Above prices for gutters, rain-water and soil pipes for under 5 cwt. lots only. Lots over 5 cwt. see List No. 3300 dated 1st February, 1955, NET and tonnage allowance. 4-ton lots 5 per cent., 2-ton lots 2½ per cent.

L.C.C. COATED DRAIN PIPES

In 9-fts.

	cwt.	qr.	lb.	per yd.	Bends	Branches
4 in.	1	1	17	24/10	17/3	30/6
6 in.	2	0	1	36/10	36/–	62/–

ASBESTOS RAIN-WATER PIPES AND FITTINGS

All less 17½ per cent. discount.

		2 in.	2½ in.	3 in.	4 in.
Pipes 6-ft. lengths	...per yd.	3/9	4/–	4/10	6/5
Shoes	... each	2/5	2/8	3/2	4/3
Single Branches ...	„	3/9	4/6	5/4	7/6
Bends square or obtuse	„	2/8	2/11	3/9	5/4
Swan Necks 4½ in. proj.	„	2/11	3/9	4/3	5/11
do. 6 in. do.	„	3/2	3/9	4/10	6/5

ASBESTOS O.G. GUTTERS AND FITTINGS

		4 in.	4½ in.	5 in.	6 in.
Gutters 6-ft. lengths	...per yd.	3/7	3/11	4/8	5/7½
Drop ends	each	2/10	3/4	3/10	4/7
Stop Ends	„	/10	/11	1/–	1/2
Angles	„	2/11	3/5	4/1	4/10
Nozzles	„	2/10	3/4	3/10	4/7
Union Clips	„	1/5	1/8	2/1	2/5

ASBESTOS HALF-ROUND GUTTERS AND FITTINGS

		3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters 6-ft. lengths	...per yd.	2/6	2/11½	3/0½	3/7	5/–
Drop ends	each	2/1	2/5	2/8	2/11	4/3
Stop ends	„	/9	/10	/11	1/–	1/2
Angles	„	2/5	2/8	2/11	3/2	4/3
Nozzles	„	2/1	2/5	2/8	2/11	4/3
Union Clips	„	1/–	1/1	1/2	1/4	2/–

METALS—*continued*

	Per ton basis in London £ s. d.
Iron—Staffordshire Crown Merchant Quality	41 17 6
Mild Steel Bars	37 14 0
Mild Steel Hoops	39 1 0

	Ex Merchant's Stock per ton Two-ton lots £ s. d.
Soft Sheets C.R. and C.A.—	
20 gauge	49 6 0
24 gauge	51 16 0
26 gauge	54 16 0
Galvanised Corrugated sheets 6 ft. to 9 ft.—	
20 gauge	56 6 6
24 gauge	59 16 6
26 gauge	65 1 6
Galvanised Flat sheets C.R. and C.A.—	
20 gauge	57 16 6
24 gauge	61 6 6
26 gauge	66 11 6

Plumbers' Brass Work, Copper, Zinc, etc.

Delivered in London area.

All per doz. M.O.H.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown bib cocks Crutch head for iron	77/-	114/6				
Toilet bib cocks for iron ...	99/-	142/-				
Screwdown stop cocks for iron	66/-	95/9	188/-	323/6	462/-	815/-
do. with two unions for lead	89/-	132/-	234/4	419/-	554/6	1234/3
Double nut boiler screws ...	16/6	23/3	42/-	43/-	59/6	83/8
Heavy Croydon ball valves ...	68/3	155/3	237/7	433/6	614/-	
Plumbers' union brass lead to iron	17/4	21/-	34/9	60/6	74/6	145/3
	1½ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
Caps and screws	29/9	36/4	52/9	82/6	105/6	137/6
Brass sleeves		27/6	27/6	49/6	66/-	67/-
		1½ × 6 lb.	1½ × 6 lb.	2 × 7 lb.	3 × 7 lb.	
Lead P. trap with brass cleaning screws		63/6	79/6	127/-	217/3	
Lead S. trap do.		77/-	95/-	156/3	281/-	

		s. d.
Solder		
Plumbers'	per lb.	3 5
Tinmen's	,,	4 2
Blow pipe	,,	4 3

Copper tubes BSS 659/1944 on the basic price of 39½d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 3 cwt.

	Extra d.	Total per lb. d.
½ in. × 19 gauge ...	12½	51½
¾ in. × 19 ,, ...	10½	50
1 in. × 18 ,, ...	9½	48½
1¼ in. × 18 ,, ...	8½	48
1½ in. × 18 ,, ...	8½	48
2 in. × 17 ,, ...	10½	49½

		£ s. d.
Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras	per ton	402 5 0
Sheet Zinc 10 gauge (25 SWG) 5 cwt. lots upwards	per cwt.	8 6 0
do. 12 gauge (23 SWG) do. ...	,,	8 4 0
do. 14 gauge (21 SWG) do. ...	,,	8 3 0
Brass tubes basic price, plus gauge and manufacturing extras	per lb.	2 7

LEAD SHEET AND PIPES

Basis selling price in minimum one-ton delivery to one address in London or Home Counties.

		£ s. d.
Lead Sheet, English, 3½ lb. substance and upwards	per ton	142 5 0
Lead Water Pipe in coils	,,	143 10 0
Lead Soil Pipe 10 ft. or over 2 in. to 4 in. dia. ...	,,	145 0 0
do. over 4 in. dia.	,,	147 0 0
Lead Gas or Untinned Compo pipe	,,	145 0 0
Extras over Basis for quantities under 1 ton		
5 cwt. and under 1 ton	per cwt.	2 0
3 cwt. do. 5 cwt.	,,	4 0
1 cwt. do. 3 cwt.	,,	6 0

Smaller quantities than 1 cwt. priced specially.
Supplying sheet lead and lead pipe to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.
Allowance for Old Lead, collected £100 5s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

		£ s. d.
Coarse Pink in 1-ton loads and over Delivered on Site	per ton	7 6 6
do. White do. do. ...	,,	7 14 3
Sirapite Coarse do. do. ...	,,	7 9 0
do. Fine do. do. ...	,,	7 17 0
Blue Lias Lime in 6-ton loads	,,	6 9 6
Hydrated Lime do.	,,	5 12 6
Lump Lime do.	,,	5 2 0
White Keen's or Parian Cement in 1-ton loads ...	,,	10 4 0
Pink Keen's or Parian Cement in 1-ton loads ...	,,	9 18 6
Granite Chips in 6-ton loads	,,	2 6 3
Hair	per cwt.	4 17 6
Gypsum Plaster Lath or Base Board ⅜ in. thick 600 yds. and over in one delivery. Delivered site ...	per yd.	2 3
1,200 yds.	,,	2 2½
Gypsum Plaster Wall Boards, 3 and 4 ft. wide, 6 to 12 ft., ½ in. thick, 600 yds. and over in one delivery. Delivered site	,,	2 6
1,200 yds.	,,	2 5½

PAINT AND DISTEMPER

Delivered London area.

		£ s. d.
Ceiling Distemper	per cwt.	1 7 6
Washable Distemper	,,	5 5 0
Gloss Paint	per gal.	2 10 0
Snowcem cement paint (in 1 cwt. drums)	per cwt.	3 11 0

Lead Products and Oils.

Ground White Lead, 1 cwt. kegs	per cwt.	8 18 0
Genuine White Lead Paint, 1-19 gal. lots in 1 gal. tins	per gal.	3 2 0
Genuine Red Lead, Dry, 1 cwt. keg	per cwt.	6 19 3
Genuine Linseed Oil Putty, 1 cwt. keg	,,	2 11 0
Size XD quality, 28 lb.	per tin	9 0
Raw Linseed Oil (5 gal.) Drums extra	per gal.	12 0
Boiled Linseed Oil (5 gal.) do.	,,	12 6

Sundries.

Turpentine substitute (5 gal.) drums extra ...	,,	5 6½
do. do. (40 gal.) do. do.	,,	4 8½
Solignum, Brown (5 gal. cans) Exterior	,,	6 6
Creosote (40 gal. barrels)	,,	2 0
Paste Powder (1 lb. packets)	per lb.	1 6
White Lining Paper	per piece	1 0

VARNISHES, etc.

Delivered London area.

		£ s. d.
Oak Varnish, Outside or Inside	per gal.	1 12 6
Oak Pale Copal do.	,,	1 18 0
Hard Drying Oak for Inside	,,	2 0 0
Crystal Paper Varnish do.	,,	2 0 0
Eggshell Flat Varnish do.	,,	2 14 0
Finest Carriage Varnish	,,	2 10 0
Front Door Varnish	,,	2 0 0
Japan Gold Size	,,	1 12 6
Black Japan	,,	1 14 0
Brunswick Black	,,	1 10 0
Berlin Black	,,	1 5 0
Terebene	,,	1 8 0
Knotting (1 gal. bottles free)...	,,	2 2 0
French and Brush Polish (do.)	,,	1 18 0

GLASS

Delivered London area.

	Per ft. super s. d.
18 oz. Sheet Glass Ordinary Glazing Quality. Cut Sizes	5½
24 oz. ,, ,, ,, ,, ,, ,,	7½
26 oz. ,, ,, ,, ,, ,, ,,	10
32 oz. ,, ,, ,, ,, ,, ,,	1 1
⅛ in. Rolled Plate	9
3/16 in. and ¼ in. Rough Cast	1 0
⅛ in. Figured Rolled and Cathedral, Standard patterns : White	9
do. Standard Tints	1 4½
do. Special Tints	2 9
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating	1 1
¼ in. Wired Cast	1 2
¼ in. Georgian Wired Cast	1 2½

Hollow Glass Blocks—		Each
P.B.2	5¾ × 5¾ × 3⅞ in.	2 9
P.B.3	7¾ × 7¾ × 3⅞ in.	4 2
P.B.32	7¾ × 7¾ × 3⅞ in.	4 2

Radiused Corner Blocks to match up with—	
P.B. 2	5 3
P.B. 3	6 9
P.B. 32	6 9

¼ in. Polished Plate Glass, G.G. Quality—		Per ft. super
In plates not exceeding	2 ft. sup.	3 7
,, ,, ,,	5 ft. sup.	4 5
,, ,, ,,	45 ft. sup.	5 1
,, ,, ,,	100 ft. sup.	5 6

¼ in. Polished Plate, extra sizes, *i.e.* plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality —Not exceeding 135 ft. sup. or 250 in. one way or 135 in. both ways 8 4
Not exceeding 180 ft. sup. or ditto 11 3
Not exceeding 200 ft. sup. or ditto 16 0
Plates exceeding 200 ft. sup., prices on application.
Substances other than ¼ in. Polished Plate at Special Prices.

Quantity Tariff—Sheet and Sundry Glass.
The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass	Minimum quantity	Per ft. super s. d.
18 oz. sheet O.Q.	3,000	4½
24 oz. ,, ,, ...	2,000	6½
26 oz. ,, ,, ...	2,000	7½
32 oz. ,, ,, ...	2,000	10½
⅛ in. Rolled Plate	1,000	7½
⅛ in. Figured Rolled and Cathedral Standard Patterns, White	1,000	7½
⅛ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte...	1,000	10½
3/16 in. and ¼ in. Rolled Plate or Rough Cast ...	2,000	10½
¼ in. Wired Cast, Hexagonal...	2,000	11½
¼ in. Georgian Wired Cast	2,000	1 0½

The Builder

CURRENT RATES OF WAGES

AS FROM FEBRUARY 7, 1955. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors.)

KEY TO SCHEDULE OF GRADE RATES.

Grade Classification.	A	A1	A2	A3
Craftsmen	3/9½	3/9	3/8½	3/8
Labourers	3/4	3/3½	3/3	3/2½

Town.	Grade.
Aberavon	A
Aberdare	A
Abergavenny	A
Abingdon	A2
Accrington	A
Addlestone	A
Aldeburgh	A2
Aldershot District	A2
Alfreton U.D.	A
Alnwick	A1
Altrincham	A
Amble	A1
Amersham	A1
Ammanford	A
Andover	A2
Ardingly	A2
Arundel	A2
Ascot	A2
Ashby-de-la-Zouch U.D.	A
Ashby Woulds U.D.	A
Ashford (Kent)	A2
Ashford (Middlesex)	A
Ashington	A
Ashtead	A
Ashton-under-Lyne	A
Aspatria and Brayton	A2
Atherstone R.D. (parts of)	A
Aylesbury	A2
Aylesby (Yorks).	A
Aylesham	A2
Bagshot	A2
Bakewell U.D.	A2
Banbury	A2
Barnard Castle U.D.	A
Barnoldswick U.D.	A
Barnsley	A
Barrow-in-Furness	A
Barrow-upon-Soar R.D. (exc. Thrussington A2)	A
Barry	A
Basford R.D.(exc. Willough-by-on-the-Wolds A1)	A
Basingstoke	A1
Bath	A
Batley	A
Baxterley	A1
Beaconsfield & District	A1
Beamish	A
Bearl	A
Bearpark	A
Beccles	A2
Bedale R.D.	A
Bedford	A
Bedlington	A
Bedwas	A
Beeston & Stapleford U.D.	A
Belper U.D.	A
Belton	A
Berkhamsted	A
Berrington	A1
Berwick District	A
Beverley	A
Bexhill-on-Sea	A2
Biggleswade	A2
Billericay	A
Billing	A
Billingham U.D.	A
Bilsthorpe	A
Birchington	A2
Birkenhead	*
Birmingham C.B.	†A
Bishop Auckland	A
Bishop's Stortford	A
Bispham	A
Blackburn	A
Blackpool	A
Blackwell R.D.	A
Blaydon U.D.	A
Blidworth	A
Blyth	A
Bognor Regis	A2
Boldon U.D.	A
Bolsover U.D.	A
Bolton	A
Bourne End	A1
Bournemouth District	A
Bracknell	A2
Bradford	A
Bradford-on-Avon	A2
Braintree	A1
Breconshire, County of...	‡A2
Brent Knoll	A2
Brentwood	A
Bridlington	A
Brierfield	A
Brighouse	A
Brighton	A
Bristol	A
Broadstairs	A2
Bromsgrove U.D.	A
Brough	A
Broughton (Cheshire)	A
Buckley	A
Bungay	A2
Burnham-on-Crouch	A2
Burnley	A
Burton-on-Trent C.B.	A
Bury	A
Bury St. Edmunds	A1
Buxton	A
Byfleet	A1
Calder Valley	A
Cambridge	A
Cannock U.D.	A
Canterbury	A2
Cardiff	A
Cardiganshire, County of	‡A2
Carlisle	A
Carmarthenshire, Cnty of	‡A2
Caernarvonshire, Cnty. of	‡A2
Carnforth	A
Castleford	A
Caterham	A
Chapel-en-le-Frith	A
Charmy Down	A
Chatham & District	A1
Cheadle (Staffs) R.D.	A
Chelmsford	A
Cheltenham	A
Chepstow	A1
Chertsey	A
Chester	A
Chesterfield M.B.	A
Chesterfield R.D.	A
Chester-le-Street U.D.	A
Chichester	A2
Chippenham (inc. Chippen-ham Within and Harden-huish)	A2
Chorley	A
Clacton	A1
Cleethorpes	A
Clevedon	A1
Cleveleys	A
Clitheroe	A
Coalville U.D.	A
Cobham (Surrey)	A
Colchester	A
Colne	A
Colwyn Bay	A1
Congleton	A1
Consett	A
Conway	A1
Cornwall, County of	‡A2
Coventry C.B.	A
Cranbrook	A2
Cranleigh	A2
Crawley (Sussex)	A1
Crewe	A
Cromer	A1
Crowborough	A2
Cuckfield	A2
Dalton-in-Furness	A
Darlington District	A
Darwen	A
Deal	A2
Denbigh Town	A2
Derby C.B.	A
Devizes	A2
Devon, County of	‡A2
Dewsbury	A
Didcot	A2
Diss	A2
Doncaster C.B.	A
Dorking	A
Dorset, County of (except-ing Poole, Swanage and Wimborne A1)	A2
Dover	A2
Dovercourt	A
Driffield U.D.	A1
Droitwich M.B.	A
Dudley M.B.	A
Dunstable	A
Durham City	A
Eastbourne	A
E. Glam. & Mon. Val.	A
East Grinstead District	A2
Eastwood (Notts.) U.D.	A
Ebbw Vale & District	A
Edenbridge	A2
Ely	A2
Epping	A
Exeter	A
Fakenham	A2
Falmouth	A2
Fareham	A
Faversham	A2
Felixstowe	A1
Filey U.D.	A
Fleetwood	A
Flint	A
Folkestone	A2
Frinton	A1
Frome	A1
Gainsborough U.D.	A
Gateshead	A
Gillingham (Kent)	A1
Glossop	A
Gloucester	A
Gloucestershire, Cnty. of	‡A2
Godalming	A2
Goole M.B.	A
Gosport	A
Grantham M.B.	A
Gravesend	A
Great Yarmouth	A
Grimsby C.B. & R.D.(part)	A
Grimsby R.D. (remainder)	A2
Guildford District	A2
Guilsborough	A1
Guiseley	A
Halesowen M.B.	A
Halifax	A
Halstead	A2
Haresfield	A1
Harlow	A
Harpenden	A
Harrogate	A
Hartlepool	A
Harwich	A
Haslemere	A2
Hastings	A2
Hatfield (Herts.)	A
Haywards Heath	A2
Hemel Hempstead	A
Henley-on-Thames	A2
Hereford	A2
Herefordshire, Cnty. of	‡A2
Herne Bay	A2
Hertford	A
Hexham U.D.	A
Heysham	A
High Wycombe	A1
Highworth	A2
Hinckley U.D.	A
Hitchin	A
Hoddesdon	A
Horley	A2
Horsham	A2
Horwich	A
Huddersfield	A
Hull	A
Hunstanton	A2
Huntingdon (Staffs)	A
Ilkley	A
Ingatestone	A1
Ipswich	A
Isle of Sheppey	A2
Isle of Thanet	A2
Isle of Wight	A2
Jarrow M.B.	A
Keighley	A
Kendal	A
Kenilworth U.D.	A
Kettering M.B.	A
Keynsham	A
Kidderminster M.B.	A
King's Lynn	A1
Kingskerswell	A1
Kingsteignton	A1
Kirkham	A
Knaresborough U.D.	A
Knowle	A1
Lancaster	A
Leamington M.B.	A
Leatherhead	A
Leeds	A
Leicester C.B.	A
Leighton Buzzard	A1
Letchworth	A1
Lewes	A2
Lichfield M.B.	A
Lincoln C.B.	A
Littlehampton	A2
Liverpool	*
Llandudno	A1
Llanelly	A
London	*
Long Eaton	A
Loughborough M.B.	A
Louth M.B.	A2
Lowestoft	A
Loxton	A2
Luton	A
Lyneham (Devon)	A2
Macclesfield	A
Maidenhead	A1
Maidstone	A1
Maltby	A
Maldon (Essex)	A1
Malvern U.D.	A1
Manchester	A
Manningtree	A1
Mansfield M.B.	A
March	A2
Margate	A2
Market Harborough U.D.	A
Maryport	A
Matlock U.D.	A1
Melksham	A2
Melton Constable	A2
Melton Mowbray U.D.	A1
Merthyr	A
Middlesbrough	A
Middleton	A
Middlewich	A
Milford Haven	A1
Morecambe	A
Morley	A
Mundesley	A2
Nantwich	A
Nelson	A
Newark-on-Trent R.D.	A1
Newbury	A2
Newcastle-on-Tyne	A
Newcastle-under-Lyme	A
New Forest District	A1
Newmarket	A1
Newport, Mon.	A
Newport Pagnell	A2
Newton Abbot	A2
Northallerton Dist.	A
Northampton C.B.	A
North Shields	A
Norton Radstock	A1
Norwich	A
Nottingham C.B.	A
Nuneaton M.B.	A
Oakham U.D.	A2
Oldham	A
Ongar	A
Ormskirk	A
Ossett and Horbury	A
Oxford	A
Oxted	A1
Paignton	A1
Peterborough	A
„ Soke	A1
Pickering	A3
Plymouth	A
Pontefract	A
Pontypridd District	A
Portishead	A
Portland Stoneyards	A
Portsmouth	A
Port Talbot	A
Preston	A
Pudsey	A
Pulborough	A2
Radnorshire, County of	‡A2
Ramsgate	A2
Rayleigh	A
Reading	A
Redcar B.	A
Redditch U.D.	A
Redhill and Reigate	A
Ripon	A3
Rochdale	A
Rochester	A1
Rotherham	A
Rugby M.B.	A
Saffron Walden	A2
St. Albans	A
St. Helens	A
St. Neots	A2
Salisbury City	A2
Salisbury Plain	A2
Sawbridgeworth	A
Saxmundham	A2
Scarborough	A
Scunthorpe	A
Selby	A
Sevenoaks	A1
Sheerness	A2
Sheffield	A
Shipley	A
Shoeburyness	A
Shoreham	A
Shrewsbury M.B.	A
Sittingbourne	A2
Skegness U.D.	A1
Skipton U.D.	A
Sleaford U.D.	A2
Slough	A
Smethwick C.B.	†A
Snettisham	A2
Somerset, County of	‡A2
Southampton	A
Southend-on-Sea Dist.	A
Southport	A
South Shields C.B.	A
Spalding U.D.	A2
Stafford M.B.	A
Staines	A
Stamford M.B.	A1
Stantonwick	A
Stevenage	A
Stockport	A
Stockton R.D.	A
Stockton-on-Tees	A
Stoke-on-Trent C.B.	A
Stoke Orchard	A1
Stourbridge M.B.	A
Stourport U.D.	A
Stowmarket	A1
Stratford-on-Avon M.B.	A
Sunderland District	A
Sunningdale	A1
Sutton Coldfield M.B.	A
Swaffham	A2
Swanage	A1
Swansea	A
Swindon	A
Swinton U.D.	A
Tamworth M.B.	A
Tenterden	A2
Tewkesbury	A1
Thames Haven	A
Thetford	A2
Thorpe Bay	A
Thurrock U.D.C. Area	A
„ North of, to Billericay	A
Tilbury	A
Todmorden	A
Tonbridge	A1
Torquay	A1
Totnes	A1
Trowbridge	A2
Tunbridge Wells	A1
Tynemouth C.B.	A
Uppingham (Salop)	A1
Uttoxeter U.D.	A2
Wakefield	A
Wallsend B.	A
Walsall C.B.	A
Walsden	A
Walton-on-Naze	A1
Ware	A
Warminster	A2
Warrington	A
Warwick M.B.	A
Wellington U.D.	A
Wells (Norfolk)	A2
Welwyn	A
Welwyn Gar. City	A
West Bromwich C.B.	A
Westbury	A2
Westcliff-on-Sea	A
Westerham	A1
Weston-super-Mare	A1
Weybridge	A
Weymouth	A1
Whitby U.D.	A1
Whitstable and District	A2
Wickford	A
Widnes	A
Wigan	A
Wigton	A2
Willington	A
Wilmslow	A
Wilts. County of	‡A2
Winchester	A1
Windermere	A2
Windsor and Eton	A
Wisbech	A2
Witham	A1
Woking (District)	A1
Wokingham	A2
Wolverhampton C.B.	A
Woodbridge	A2
Worcester C.B.	A
Workington	A
Worksop M.B.	A
Worthing	A2
Wrexham (incl. Cefn)	A
Wroughton	A1
Wylam	A
Wymondham	A2
York	A

For Birkenhead, Liverpool and London the rates are:—Craftsmen, 3s. 11d.; Labourers, 3s. 5¼d. In the case of London the rate beyond the 12-mile radius is:—Craftsmen, 3s. 10¼d.; Labourers, 3s. 5d. †Plus 2d. per working day. ‡ This is the County rate and applies except where higher grades are stated.

NOTE.—Carpenters and Joiners providing own tools when employed in establishments operating under the Supplementary Rules for Woodworking Factories and Shops, receive 2d. per day; when employed on other building industry work, 4d. per day.

WOMEN'S RATES.—In all districts throughout the country the rate of wages for women engaged in craft processes is 2s. 11d. per hour. Women engaged on work other than craft processes, 2s. 7d. per hour.

For Building Trade Wages in Scotland see page 452

NEWS IN BRIEF

CITY SMOKELESS ZONE

At the meeting of the Court of Common Council, on March 3, proposals for making the City of London a smokeless zone from October 2 next were approved. Details of the proposals were given in our last issue.

CORROSION-RESISTANT FLOORS

The particular problems of corrosion resistance that arise with reinforced concrete floors are discussed in Part 1 of Building Research Station Digest No. 73, entitled "Corrosion-Resistant Floors." Copies, price 3d., from the Stationery Office.

PROTECTION OF STEEL

A symposium on "The Protection of Structural Steel," organised by the Corrosion Group of the Society of Chemical Industry, will be held in the lecture theatre of the Institution of Civil Engineers during the days of March 31 and April 1 next. Details from the Hon. Secretary, Mr. S. C. Britton, Tin Research Institute, Fraser-road, Perivale, Greenford, Middlesex.

THE FUTURE OF BRICK

The development and potentialities of brick and other clay products is outlined in an article entitled "Brick Faces the Future" in the tenth issue of Volume 2 of "The Brick Bulletin," and some of the statements affecting clay products in relation to new developments in building materials, liberally reported in recent months, are critically examined from the brick industry's point of view. Copies from the publishers, the National Federation of Clay Industries, Drayton House, 30, Gordon-street, WC1.

SAFETY CONFERENCE

The second afternoon conference for the purpose of training apprentices and young persons in safety was held at the Safety, Health and Welfare Museum on February 17. The chair was taken by Mr. W. Dawes, of Woodall Duckham Co., Ltd., and a talk was given by Mr. J. A. Hayward, of John Laing and Son, Ltd., in which he pointed out that the main causes of accidents in the building industry were "falls of persons," "falls of materials" and "bad housekeeping." He stated that these three clauses, if eliminated, would mainly solve the problem of accident prevention in the industry. After the talk, the apprentices were shown a film entitled "Watch Your Step."

1956 BERLIN EXHIBITION

An international building exhibition is to be held from July 14 to September 30, 1956, in connection with the reconstruction of the Hansa area in Berlin. This area was one of the most heavily devastated residential parts of central Berlin, and its rebuilding will provide 1,500 housing units, a school, kindergartens, two churches, bridges and a hospital.

The area, as a vast modern building site, will form the core of the exhibition and one part will consist of finished buildings; one part will be partly finished and a further part in the initial stages, thus representing all phases of the building process. This will be supplemented by displays of new techniques, products and equipment, as well as conferences on planning and design. The German architects engaged on the project will cooperate with such foreign experts as Messrs. F. R. S. Yorke, Oscar Niemeyer, Alvar Aalto, Mies van der Rohe, and Eric Saarinen.

NEW APPOINTMENT

Mr. T. A. O. Brownlee has been appointed building superintendent to Crewe Corporation.

CONCRETE CLADDINGS

To indicate the properties and uses of precast concrete facing slabs, the Cement and Concrete Association have published an illustrated booklet discussing colour, texture, pattern and methods of surface treatment. Attention is also focused on the problems related to the size of slabs, the use of reinforcement, jointing and weathering. Copies obtainable free from the Association at 52, Grosvenor-gardens, SW1.

LEADWORK BOOKLET

The second number of their publication "Leadwork for Plumbers" has been published by the Lead Sheet and Pipe Council, in association with the Lead Development Association, Eagle House, Jermyn-street, SW1. This issue covers leadburned joints for soil pipes, "easy" bends, chimney stack flashings, and traditional canopy leadwork.

CANADIAN WEST COAST WOODS

The Lumber, Plywood and Red Cedar Shingle Manufacturers' Associations of British Columbia have undertaken a nation-wide publicity campaign in Canada to further the use of West Coast woods. The campaign has consisted of the construction of ten all-timber houses, called "Trend Houses"—one being erected in each Province. These homes demonstrate the applications and advantages of Canadian West Coast woods, and a booklet has been produced by the Associations illustrating the dwellings. Copies can be obtained free from the office of the High Commissioner for Canada, Canada House, London, SW1.

BRAINS TRUST AT BATH

Building economy started at the drawing-board stage, and once an economic plan had been decided it should be carried out without any changes during construction, stated Mr. C. D. Calverley, chairman of the Housing Improvement Association, speaking as a member of the panel of experts in a brains trust held by the South-Western Federation of Building Trades' Employers on February 21 at the Pump Room, Bath. He was replying to a question submitted by Alderman S. Day, chairman of Bath Housing Committee, as to what building methods would produce houses more quickly and cheaply. Mr. Calverley stated that a bonus incentive scheme related to wages was absolutely necessary, and this view was supported by the question-master, Mr. George Grosvenor, immediate past-president of the National Federation. Mr. E. H. Button, vice-chairman of the Council of the Royal West of England Academy, said that buildings might be cheaper if architects and builders could co-operate more at the design stage. The meeting was attended by more than 300 people.

PERSONAL COLUMN

Mr. R. B. E. Jackson, former chairman and managing director of Silexine Paints, Ltd., has joined the Sissons group of companies and has been appointed sales director of A. T. Morse Sons and Co., Ltd., Plaistow. Captain A. E. Campbell Harris, MC, at his own request, is resigning from the board of A. T. Morse Sons and Co., Ltd., with effect from May 31, in order to attend to his other interests.

SCHOLARSHIPS FOR YOUNG BUILDERS

National President's Statement

Mr. HARVEY G. FROST, OBE, National president, speaking at the annual dinner of the Yorkshire Federation of Building Trades Employers, at Sheffield, on Wednesday, said that each month more and more lads were coming forward to register under their National Apprenticeship Scheme. There was, and there would remain for many years yet, plenty of room at the top in the building industry for those who were keen to learn their job well and wanted to get on.

"The industry is determined to encourage these young men," Mr. Frost continued, "and only last week the National Joint Council for the Building Industry, acting through its National Joint Apprenticeship Board, announced that it is to offer two full-time scholarships for a university degree or higher national diploma course for competition during the current school year. The scholarships will be for apprentices and young craftsmen. Grants for each scholarship will cover all fees and examination expenses plus a maintenance allowance. Another scholarship is offered to plasterer apprentices.

"I hope that, on the recommendation of the principal or headmaster of their technical college and their employer, the best types of young men will apply for these scholarships. We want fully trained men for the responsible jobs in the industry that are waiting to be filled."

PAINTING CONTRACTORS

Annual Dinner and Dance

THE annual dinner and dance of the Federation of Painting Contractors was held at the Dorchester Hotel, London, on March 7, when Mr. Peter H. Kenyon, the president, presided.

In proposing the toast of the Federation Sir George H. Fretwell, KBE, CB, MICE, Director General of Works, Air Ministry, congratulated its members on the co-operation they had helped to maintain with his Ministry and other Government departments to their mutual benefit.

His and the other Ministries had an important duty to perform in preserving the capital assets of the country which, during the war years and after, had suffered neglect to an alarming degree. Only now was enough money being made available for this preservation, and they would seek the Federation's advice in spending it wisely and to the best advantage. He looked forward to the paint manufacturers and their clients producing a durable and satisfactory job.

In his reply Mr. Kenyon said that although the paint manufacturers were in competition one with another they must all endeavour to uphold the status of their trade and comply with the motto "due and proper performance."

The toast of "The Ladies and Other Guests" was proposed by Mr. Samuel Clipson (founder-president of the Federation) and responded to by Mrs. Peter H. Kenyon and Mr. R. Baker Smith (Master, Worshipful Company of Painters).

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TRADE NEWS

CHANGE OF ADDRESS

On March 14, Jenolite, Ltd., will be moving to new premises at Nos. 13 to 17, Rathbone-street, W1 (Tel.: Museum 5411).

ALUMINIUM FOR ROOFING

A set of illustrated technical notes for plumbers, describing how to use Super Purity aluminium for flashings and general roof work, can be obtained from the British Aluminium Co., Ltd., Norfolk House, St. James's-square, SW1.

PUTTY AND MASTIC SPECIFICATIONS

Messrs. Sealanco (St. Helens), Ltd., have produced specification sheets for Sealon metal casement putty; Semas bedding mastic; Semanco mastic; Semanco non-hardening compound; Seaflex roofing putty and Semanco asbestos jointing compound. These are understood to be the first specifications to have been produced for this type of product.

METAL WINDOWS BOOKLET

A description and working details of their purpose-made metal windows and doors, as well as their light structural steelwork, are given by Maclean and Co. (Metal Windows), Ltd., 39, High Holborn, WC1, in a recently produced booklet. Another illustrated booklet published by the same company provides information on their range of pavement lights, roof lights and concrete fencing.

STRUCTURAL SECTION

A cold rolled triangular section produced in 16-gauge mild steel, galvanised mild steel or aluminium is being manufactured under the name of "Trisec" by Imex Engineering, Ltd., Tavistock House South, Tavistock-square, WC1, for use as a component in all types of structures. It can be used for racks, concrete inserts, shelving, fixtures and pillars and is understood to largely eliminate the need for fixings and to facilitate the dismantling and re-erection of structures.

LOCKS AND HARDWARE

A well-illustrated and bound catalogue has been produced by the Yale and Towne Manufacturing Co., Willenhall, Staffs, providing fullest details of their wide range of locks, builders' hardware and door closers. The selection of locks manufactured by the company is so comprehensive as to cover all possible requirements, and of particular interest is the Grand Master-Keyed system, for public buildings, hotels, etc., where the series is divided into subordinate suites, each with their own sub-master key, all being controlled by one grand master key.

TRANSLUCENT SHEETS

Corrugated sheets made from thermo-setting resins reinforced with glass-fibre are being marketed by Saro Laminated Wood Products, Ltd., 45, Parliament-street, SW1. One type called "Saropane" incorporates a glass mat and is a normal translucent sheet designed for strength, light-diffusion and economy. The second type, "Sarolite," incorporates a woven glass-fibre cloth to provide good light diffusion and strength. Both types are claimed to be stronger than steel, weight for weight, and no special methods of installation are necessary, as the sheets can be worked with ordinary tools.

MOBILE HOIST

A small low-cost mobile hoist for use primarily on standard housing sites has been produced by the British Hoist and Crane Co. of Compton, Berks. This "pole hoist," weighing just over 5 cwts., is mounted on large diameter pneumatic-tyred wheels. It can be attached to ordinary putlog scaffold so as to throw no strain upon

the scaffold structure, and no extra scaffolding or bracing is required. The machine employs a similar lifting principle to the ordinary crane. A winch mounted at the base is controlled by a rope fitted to the hoist control arm which enables the operator to slew the hoist and lower the load direct on to the scaffold platform.

Batsford Books

HOUSES OF TODAY
by Colin Penn, A.R.I.B.A.
"... much the best of its kind. It is beautifully illustrated and contains the soundest advice on both the practical and aesthetic aspects of design." — *The Surveyor.* **30s. net**

DRAINAGE AND SANITATION
by E. H. Blake
Revised and re-illustrated.
"... this has become a standard volume covering the whole subject." — *The Engineer.* **15s. net**

MODERN PRACTICAL BRICKWORK
by W. Frost & R. V. Boughton
With over 1,000 illustrations.
"... undoubtedly the most comprehensive and up-to-date manual on the subject." — *The Builder.* **50s. net**

GUILD OF SURVEYORS

Annual Dinner and Dance

THE annual dinner and dance of the Guild of Surveyors was held on March 4 at the Cumberland Hotel, W1.

In his response to the toast of "The Guild of Surveyors," PROFESSOR A. E. RICHARDSON, PRA, MA, FRIBA, FSA, president of the Guild, spoke of the importance of the Guild in its capacity as a society to link together many branches of a great profession. He urged them to continue their work to preserve our amenities, for "no surveyor was present at the building of the tower of Babel," and to-day also "we are witnessing the confusion of our own blindness. Towers of Babel are arising in London to house millions of typists." He added that one could no longer call the designers of "these matchboxes on end" by the name of architects.

He described how he had made a special visit to the top of St. Paul's Cathedral and could see the extensive desolated areas. "No attempt has been made since peace was declared to rectify these defects—only schemes for vast towers. We should view London like Tiepolo, not with the eyes of town-planners." He urged that we should have a special parliamentary commission to rebuild London and avoid the prospect of individual speculators tied down by red tape.

Professor Richardson referred to the rebuilding of London as "a frightening affair" in which people were described as "densities" and said that the towers would be too vast for the narrow streets and would result in confusion.

We must, he argued, preserve London's magnificent skyline. "Wren crowned London with St. Paul's and towers would blanket this magnificent vision." We must not put ourselves in the hands of "men of insect minds with the ambition of giants who think only in terms of containers. Even the university cities are infected with the heresy—they, too, must be like the Argentine or Marseilles. The people from the architectural schools go to government offices and are maintained by the country to impress their ideas on us; but the people of England do not want to be cast in the same mould. They are hungry for beauty."

Professor Richardson advocated for the improvement of London a "return to elementary building construction and, above all, craftsmanship." He said that London was now a city-state rather than a city and each district should have its own civic pride. "Remember," he added, "that Christopher Wren was our greatest surveyor at a time when national taste was at its zenith."

MR. R. P. JAMES, OBE, in proposing the toast (in the absence of the Earl of Rosse, MBE), spoke of Professor Richardson's devastating criticism of the fine arts and his enrichment of the world of building. He also spoke of the good work of the Guild of Surveyors in helping young men to succeed in the world of building, which he described as "our most complicated and mysterious industry."

The toast of "The Ladies and Guests" was proposed by Mr. Gordon Tomalin, chairman of the Council, and responded to by Mr. Frederick S. Snow, OBE.

OVERSEAS BUILDING

[From Our Own Correspondents]

British Honduras.—Under the current Development Plan for British Honduras about £50,000 will be spent on telecommunications. A new radio-telephone link is to be installed to bring up to date the country's obsolescent telephone system. Negotiations are going on with British Colonial Airlines which will necessitate the building of airstrips in several places not at the moment served. A two-way bridge costing £25,000 is to be built over the Belize-Corozal road. A bridge is also urgently required in Belize itself.

On housing some £75,000 is to be spent. A large swamp of about 140 acres to the immediate north of Belize is to be filled in and used for building. When the swamp has been filled in, roads, drains and services over the area are to be commenced at an estimated cost of £90,000.

Canada.—Work is due to start this month on a £142,000 ice-hockey rink donated by Lord Beaverbrook for the use of university students and school children at Fredericton, New Brunswick. The contract is expected to be finished by next autumn, and the refrigeration pipes have been designed so that they can be used for radiant heating as well as for freezing the rink, to allow the rink to be also used as an auditorium.

Chile. — The Radio Corporation of America proposes to erect a factory in Santiago, Chile, for the manufacture of radio valves. . . . The Chilean Department of Development and Construction is studying the construction at Atacama of a plant for the production of sulphuric acid.

The Chilean Government has submitted to the International Bank for Reconstruction and Development an eight-year plan for the development of agriculture and transport. About $370m. are to be invested. Details so far released explain that the money will be used for the construction of irrigation schemes; farm buildings; land clearance; cellulose mills; wood-working plants; sugar mills; mechanised bakeries; dairy buildings; fish-preservation and refrigerating plants; railways; roads; and port development. Details can be obtained from the Chilean Embassy in London.

The Directorate of Port Works proposes spending $371m. this year on various port improvements and maintenance. . . . Road building and the erection of 459 public buildings are included in the joint five-year plan of public works. The Ministry of Works in Santiago can furnish full details.

India.—Agreement between India and the Soviet Union recently on steel production in India means that a modern integrated iron and steel plant with initial capacity of 1m. tons of ingots will be erected. The plant will be located in the Bhilai region of Madhya Pradesh and is to be commissioned by December 31, 1959. Indian Government officers in New Delhi are responsible for the scheme and all inquiries can be made there.

The Mysore State Planning and Economic Development Department has issued a report which shows that 17 major irrigation projects are in preliminary stages of construction. The Planning Commission has under consideration a housing scheme costing 1m. rupees for low-paid Government workers.

The Government of India is now giving consideration to the framing of the second five-year plan. Schemes for industrial development for inclusion in the second five-year plan have been put forward by state governments for consideration by the Indian Planning Commission. In connection with irrigation and power projects it has been stated that the following projects have been submitted by the respective state governments. The Technical Advisory Committee on Irrigation and Power Projects, which has been set up for the purpose, will obtain project reports on the various schemes and, after examining them, will recommend which of the schemes should be considered.

Andhra State has seven power projects before the committee. These are the Machkund hydro-thermal electrical scheme; Tungabhadra hydro-electric project; Nellore thermal scheme; Nandikonda scheme; Chittor scheme; Sileru scheme; and Tungabhadra common works. Assam State has three power projects: second phase of the transmission system connected with the Umtru hydro-electric project; scheme for harnessing the potential of Umtru River; multi-purpose projects. Bihar State has four projects: utilisation of power in South Bihar and Chota Nagpur; North Bihar electrification; electrification of Dumka Pakur and surrounding areas in Santhan Parganas, taking over of derelict supply undertakings and their development and loan to licencees.

Bombay State has 18 irrigation projects and seven power projects spread over three districts. The irrigation projects for the Naharashtra district are: Vir Dam project; Khade Kwasla project; Ghod River project; Mula River project; Girna River project; Bhima River project; Karanjawan project; Kukadi project; and Hatnur project. The power projects are all in this district and are: North Gujerat electric grid scheme; South Gujerat electric grid scheme; Jog Karnatak electric grid scheme; Bhandaradara - Randha hydro - electric scheme; Kalinade hydro-electric scheme; nursery schemes for the electrification of towns and villages; Hiranyakes-hy lower scheme. In the Gujerat district of Bombay there are six irrigation projects: Ukai; Mahi; Narmada; Bana River project; Sabarmati; Watrak. In the Karnatak district there are three irrigation projects: Ghataprabha stages II and III; Rakaskop; Malaprabha.

The Madhya Pradesh State has 21 irrigation projects put up for consideration. These are: Tawa River project; Arpa River project; Kanhan Canal project; Agarttap reservoir project; Bila River project; Bagh River project; Nahlsaru Tank project; Nawagaon Bundh Tank project; Sirhi Tank project; development of Maniara Tank-Son Canal project; Arhan Reservoir project; Kadar Nala project; Keswa Nalah project; Narmada River project; Sapan River project; Hasdee River project; Jonk River project; Itiadoh Tank project; Dina Nadi project; and Vilochand River project.

Spain.—The Spanish National Institute of Industry (INI) has announced a project for the installation of a petrol refinery at Puretollano (Ciudad Real). This appears to be linked with the pipeline to Cadiz to be installed under the agreement with the US, and which may possibly be duplicated for civil purposes. There are also plans for the enlarging of the oil refinery at Cartagena at present being considered by INI.

Authorisation has been given to Sociedad Hidro Nitro Espanola for the construction of a cement factory to produce 30,000 tons a year at Monzon del Rio Cinca. Under the style of "Bronzwerk Espanola SA," a number of concerns, including Bronzwerk, of Holland, and Worthington, of the USA, are to build a works for the manufacture of air-conditioning plant.

According to Spanish newspapers, an atomic pile is to be constructed for experimental purposes, to be followed later by large-scale construction of ancillary buildings. . . . A national housing committee has been set up, on the direct orders of the President, to examine the possibility of producing more houses for the people. As a number of schemes are now being drawn up, inquiries can be made from Consejo Superior de la Vivienda in Madrid. . . . Work on the US naval base at Rota, near Cadiz, has yet to begin. Tenders are still being discussed. Shipments of materials are now beginning to arrive. The National Institute of Industry have full details regarding this project.

West Indies.—The Caribbean Hotel Development Co., Ltd., with a capital of $500,000, is to build a new hotel in Tobago in the West Indies. The company has acquired 25 acres of land at Crown Point, Tobago, from the Government. . . . The San Fernando Borough Council, Trinidad, is to seek $600,000 from the Government to aid in the launching of a five-year improvement programme for the borough. Included in the scheme are a $400,000 drainage scheme and the building of a new police station at Mon Repos at a cost of $80,000.

Tobago is to have a modern high school estimated to cost $300,000. The building will be of prefabricated structure and will be erected by the management of the Bishop's Absteys High School at Mount Mario, Lower Scarborough, Tobago. The building will be erected in two stages, the first to cost $150,000 and to accommodate 300 pupils. The second stage will provide for further expansion to accommodate an additional population of 240 pupils. A permanent chapel will be erected in conjunction with the second stage.

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FIRE CEMENT
Ask at your Builders' Merchant or write for prices and name of nearest stockist to Sole Manufacturers.
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HOLBORN STREET LEEDS 6

A new Collector-General's Head Office and Customs House in Jamaica is to be constructed on the vacant site at Marcus Garvey-avenue. It will be very close to the new dock area which it is proposed to create west of the railway. About £2m. is to be spent on the first stage of this port development. Full details of this large project are obtainable from Government House, Development Department, Jamaica.

ECONOMIC SURVEY, RHODESIA

*A report on economic and commercial conditions in the Federation of Rhodesia and Nyasaland was published recently for the Commercial Relations and Exports Department of the Board of Trade in the series "Overseas Economic Surveys."

The report, which has been prepared by the United Kingdom Trade Commissioner at Salisbury, Southern Rhodesia, covers the economic and commercial field—finance, commerce, manufacturing industry, agriculture, mining, basic development, labour conditions, social conditions and the tourist industry. Copies of the report can be purchased direct from HMSO, price 5s. (by post 5s. 4d.), or through any bookseller.

RESERVOIRS IN INDIA

Large Programme Planned

INDIA'S vast irrigation schemes are now going through the Indian Planning Commission in New Delhi, writes a correspondent.

In Madras State, eight new schemes are to go forward. These are the New Kattalai high-level canal scheme; the Pullambadi scheme; the Kanhirapuzha Reservoir project; the Mani Mukhtha Nadhi Reservoir project; the Meena Karai Reservoir project; the Gomukhi Reservoir project; the Palakzhipuzha Reservoir project and the Thappiar Reservoir project. There are eight schemes mentioned for Orissa State, 13 for the Punjab, 19 for Uttar Pradesh, eight for West Bengal, seven for Hyderabad State, 12 for Madhya Bharat State, five for Mysore State, 28 for Rajasthan State, 20 for Saurashtra State, five for Travancore-Cochin State, three for Ajmer State, two for Bhopal State, 11 for Kutch State, and nine for Vindhya Pradesh State.

Of these numerous schemes there are 25 reservoirs, eight canals, and some 25 dams as well as other types of construction work connected with irrigation.

A number of power schemes are also being considered by the Planning Commission. In Madras State, eight new power schemes are being considered; in Orissa State, two; in Punjab State, 12; in Uttar Pradesh, 10; in Hyderabad State, five; in Madhya Bharat, one; in Mysore State, five; in Saurashtra State, 11; in Travancore-Cochin State, nine; in Coorg State, two; in Himachal Pradesh State, 10; in Manipur State, one. There is expected to be a great demand for materials and equipment, although India is now producing some of the machinery, and several foreign concerns are anxious to get a foothold in the scheme. British contractors are advised to communicate with the Planning Commission in India, and details are available from India House, Aldwych, London, WC2.

* From the Board of Trade Special Register Information Service.

The SCOTTISH BUILDER

Glenrothes—New Appointments

IN view of the acceptance by Mr. Norman Macdonald, MIMunE, chief engineer to Glenrothes Development Corporation, of an appointment as engineer to the Associate Ethyl Co., Ltd., Chester, the Corporation has promoted Mr. Gilbert Bald, BSc, AMICE, AMIMunE, senior engineering assistant, to be chief engineer for the new town. Mr. Bald was formerly a member of the City Engineer's staff at Dundee. Mr. Macdonald was the first Chief Engineer to be appointed by the Corporation.

To fill the vacancy in the chief architect's department, due to Mr. Maurice Sargent, ARIBA, AMTPI, having joined the town planning staff of the Edinburgh School of Art, the Development Corporation has appointed Mr. Charles Fotheringham, ARIBA, AMTPI, as senior architect-planner. Mr. Fotheringham is at present employed by the Harlow Development Corporation.

Housing in January

THE NUMBER of new houses completed in Scotland in January was 2,419; in the same month last year the figure was 2,953. Altogether 265,309 new homes (233,133 permanent and 32,176 temporary) have now been built in Scotland under the post-war housing programme.

These figures are given in the latest Housing Return issued by the Department of Health for Scotland and the Ministry of Housing and Local Government, and published on March 3 by HM Stationery Office, price 2d.

Road Schemes Delay

URGENT road and bridge schemes in Edinburgh are being held up because of lack of technical staff in the City Engineer's Department.

This was reported on February 24, at a meeting of the works committee of Edinburgh Town Council, and it was agreed that the department's authorised establishment be increased from 30 to 39. Under the new increased establishment, 17 vacancies require to be filled, 11 of them immediately.

More than a year ago the City Engineer drew up a list of urgent schemes which were being held up owing to lack of staff. He estimated the capital value of these at £930,000.

A Permanent Cure for SMOKY CHIMNEYS

The 'Ventamatt' prevents down-draught and increases up-draught, irrespective of wind direction. There are no moving parts, no small holes to get choked and the design is of the straight through type to facilitate sweeping. Specified and used by Public Authorities, Architects, Builders and Property Owners everywhere.

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AP 46-35

SCOTTISH BUILDING TRADE WAGES

FOLLOWING are rates of wages authorised by the Scottish National Joint Council as from February 7, 1955. They apply to the whole of Scotland, including the islands of Orkney, Shetland, etc.

Grade A: Craftsmen, 3s. 9½d.; Labourers, 3s. 4d.

For apprentices, the rates are:

Year.	Percentage of Craftsman's rate.	For week of 44 hours.
		s. d.
1st	25	41 8½
2nd	33½	55 7½
3rd	50	83 5
4th	66½	111 2½
5th	75	125 1½

For female labour, the rates are:

	s. d.
Operatives on craft operations (at end of probationary period)	3 4
Operatives on labouring operations (at end of probationary period)	3 0½

NEW BUILDINGS

Ayr.—Esso Petroleum Co., Ltd., are to erect a new bulk storage depot at North Harbour-st. The scheme will cost £18,000, but is part of a larger project which will ultimately cost some £60,000.

Aberdeen.—Plans prepared and approved for cooked meat factory to be erected at Millview-rd. site, Tulles, by the Cooked Meat Services, Ltd., 141, Crown-st., Aberdeen.—Plans prepared and approved for 200 houses for Meathryfold housing scheme. Architect, Mr. J. Austen Bent, ARIBA, 15, Palmerston-pl., Westend, Edinburgh.

Blantyre.—Lanarkshire CC has had plans prepared and approved for sch. at Goatshill Development Site. Architect, William L. Watt, FRIBA, County Planning Offices, Albert-st., Motherwell-Wishaw.

Falkirk.—Plans have been prepared for a garage, new offices, etc., to be erected at Main-st., Bainsford, by Johnstone, Stewart & Sons, Ltd., Falkirk.

Fifeshire.—Plans are in hand for Government buildings which the Corporation of Kirkcaldy propose should be erected opposite the Town House, High-st. Architect, Mr. S. Sim, FRIBA, Office of Works, George-st., Edinburgh.

Fraserburgh.—Plans prepared and approved for 110 houses. Council A is Mr. G. S. Stewart, ARIAS, ARSI, Corporation Offices, Fraserburgh.

Glasgow.—Plans prepared and approved for extensive extensions for John Menzies & Co., Ltd., Hanover-bldgs., Rose-st., Edinburgh, at 88 to 104, West Nile-st. Architect, Mr. N. W. Babb, FRIBA, 96, Park-la., WC1.—Plans prepared for King's Park Picture Theatre Co., Ltd., 65, Ronfield-st., for alterations and additions to "The Cinema," St. James-st., have been approved. Architects are Grattan & Maclean, F.FRIBA, 51, Woodside-terr., Woodlands-rd., Charing Cross, Glasgow, WC3.

Hamilton.—Lanarkshire CC has under consideration plans for a Protestant Sec. Sch. proposed to be erected at the Udston-Hillhouse Housing Development Site. Architect, Mr. William R. Watt, FRIBA, Education Offices, Albert-st., Motherwell-Wishaw.

Inverness-shire.—Scottish Special Industrial Estates, Ltd., 3, Woodside-pl., Woodlands-rd., Charing Cross, Glasgow, intend to erect industrial estate in Highland Development area of Inverness, and have appointed Wylie, Shanks & Wylie, F.ARIBA, 12, Claremont-gdns., Charing Cross, Glasgow, WC3, architects; Rennie & Kirkwood, CE, 59, Bath-st., consulting engineers; Halley & Kirkwood, 36, Elmbank-cres., Charing Cross, heating and lighting engineers; and Baxter, Dunn & Gray, F.FSI, 235, Bath-st. and High-st., Inverness, quantity surveyors.

Lanarkshire.—Plans prepared for the Armac Engine Co., Ltd., 2239, London-rd., for new office buildings. Architect, Mr. Wiliam J. Gibson, FRIBA, 36, Elmbank-cres., Charing Cross, Glasgow, WC2.—Plans prepared for new buildings for Maccrodden & Co., Ltd., 74, Kirkintilloch-rd., to be erected at Bishopbriggs have been approved. Architects are Lennox & Macmath, F.ARIBA, 38, Berkeley-st., Charing Cross, Glasgow, WC2.—Plans have been prepared and approved for houses at Colinhill Development District, Strathaven. Architect, Mr. James Frew, Craigielea, Chapelton.

NEW COMPANIES

THE FOLLOWING NEW COMPANIES, registered in England, have been announced by Jordan and Sons, Ltd., company registration agents.

Hadex Co., Ltd. (543251.) Regd. January 13, 1955, 69, Lee-rd., SE13. Public works contractors, etc. Nom. cap.: £100. Dir.: L. F. Edwarde.

D. R. Deeks & Co., Ltd. (543633.) Regd. January 22, 1955. Dash End, Kedington, Suffolk. Bldrs., bldrs.' mchts., etc. Nom. cap.: £1,000. Dir.: D. R. Deeks.

Robert Burrows (Builder), Ltd. (543789.) Regd. January 26, 1955. 72, Gill Bent-rd., Cheadle Hulme, Ches. Bldr. and contractor. Nom. cap.: £3,000. Permt. Dir.: R. Burrows.

H. J. Burchett, Ltd. (543833.) Regd. January 27, 1955. 7a, High-rd., Chadwell Heath, Essex. Bldrs., etc. Nom. cap.: £2,000. Dir.: H. J. H. Burchett.

Bury St. Edmunds Breeze and Concrete Products, Ltd. (543848.) Regd. January 27, 1955. 16, The Travers, Bury St. Edmunds. Specialists in shuttering for concrete constructions, etc. Nom. cap.: £1,000. Dir.: D. D. Parkyn.

J. Henry Williams & Sons (Ellwood), Ltd. (543861.) Regd. January 27, 1955. Tufthorn-av., Coleford, Glos. Bldrs. and bldg. contractors. Nom. cap.: £15,000. Dir.: J. Williams.

Tynedale Building Supplies, Ltd. (543864.) Regd. January 27, 1955. 6, Eastgate, Hexham. Bldrs.' and plumbers' mchts., suppliers of and dlrs. in stone, gravel, etc. Nom. cap.: £1,500. Permt. dir.: J. H. Newman.

B. & B. (Coventry), Ltd. (543820.) Regd. January 27, 1955. 56-62, Cambridge-st., Coventry. Bldrs., etc. Nom. cap.: £500. S. C. Brown signs as director.

J. L. Corfield & Co., Ltd. (543804.) Regd. January 26, 1955. Kingston-pl., Station-rd., Acocks Green, Birmingham, 27. Bldrs., etc. Nom. cap.: £1,000. Dir.: J. L. Corfield.

Carlyon Property Co., Ltd. (544210.) Regd. February 4, 1955. 37, Bury-st., St. James's, SW1. Bldrs. and contractors, etc. Nom. cap.: £5,000. Permt. dir.: E. E. Jones.

Harris and Richards, Ltd. (544198.) Regd. February 3, 1955. 47, Albemarle-st., W1. Bldrs., painters, interior decorators, etc. Nom. cap.: £1,000. Dir.: C. S. Harris.

Associated Constructional Developments (London), Ltd. (544145.) Regd. February 2, 1955. To acquire the whole or part of the issued share capital of Stuart B. Dickens, Ltd., and any other company carrying on business as civil and constructional engrs., ferro-concrete and bldg. contractors, etc. Nom. cap.: £10,000. Dir.: To be appointed by subs. Subs.: Barbara E. Grove-White and Sheila Collins, 6, Austin Friars, EC2.

G. Burnham & Son, Ltd. (544114.) Regd. February 2, 1955. Bldrs., decorators, contractors, etc. Nom. cap.: £2,500. Dir.: G. C. Scotcher, Starlock, Military-road, Rye, Sussex.

Charles Angelus (Building Contractors), Ltd. (544098.) Regd. February 1, 1955. 70, Gt. Portland-street, W1. Nom. cap.: £1,000. Dir.: C. A. Angelus.

East Birmingham Scaffolding Co., Ltd. (544108.) Regd. February 2, 1955. Excelsior Works, Clough-street, Stoke-on-Trent. Scaffold erectors and bldrs. Nom. cap.: £5,000. Dir.: T. Gough.

Quality Buildings (Wales), Ltd. (544067.) Regd. February 1, 1955. Ty Mor, 23, Beach-road, Newton, Porthcawl. Bldrs. and contractors, etc. Nom. cap.: £500. Dir.: R. P. Lewis.

T. M. Collum & Co., Ltd. (544076.) Regd. February 1, 1955. 11, New-court, Lincolns Inn, WC2. Bldrs., etc. Nom. cap.: £1,000. Dir.: Mrs. M. A. Collum and T. M. Collum.

W. Brealy (Builders), Ltd. (544078.) Regd. February 1, 1955. 163, Cowick-street, St. Thomas, Exeter. Nom. cap.: £10,000. Dir.: F. L. Brealy.

S. G. Cobban & Co., Ltd. (543962.) Regd. January 29, 1955. 6/10, Birkbeck-road, Ilford, Essex. Bldrs. and contractors, etc. Nom. cap.: £1,000. Dir.: S. G. Cobban.

Term Contract Contractors, Ltd. (543965.) Regd. January 29, 1955. Bldrs. and contractors, etc. Nom. cap.: £100. Dirs: To be appointed by subs. Subs.: Jean Herbert (co. dir.) and Claire Moore (secy.), 156, Strand, WC2.

Culford (Builders), Ltd. (543974.) Regd. January 29, 1955. 126, Tottenham Court-road, N1. Nom. cap.: £100. Dir.: H. S. Kriger.

Frederick Wooster & Sons, Ltd. (543975.) Regd. January 29, 1955. 15, Smith-street, Colne. To erect and construct houses, bldgs., etc Nom. cap.: £1,500. Dir.: D. F. Wooster.

Lichfield Hardware & Building Supplies, Ltd. (544287.) Regd. February 5, 1955. Nom. cap.: £100. Dirs: Not named. Sub.: W. G. Sanders, 9, Dam-st., Lichfield.

George Thompson & Co. Builders' Merchants (Spalding), Ltd. (544251.) Regd. February 5, 1955. Winfrey-av., Spalding. Nom. cap.: £12,000. Permt. dir.: G. Thompson.

Marley Concrete, Ltd. (544258.) Regd. February 5, 1955. Mnfrs. of and dlrs. in concrete, cement, lime, etc. Nom. cap.: £1,000. Dir.: F. G. Hardy, Subs.: D. de Carle and M. Scott (solrs.), 1, Bank-bldgs., Princes-st., EC2.

N. & G. Brown, Ltd. (544259.) Regd. February 5, 1955. 3, South-row, Newbiggin, Richmond, Yorks. Bldrs. and contractors. Nom. cap.: £100. Dir.: Mrs. N. I. Brown.

Jefferies Brickworks, Ltd. (544277.) Regd. February 5, 1955. Jefferies Brickworks, Ebley-rd., Stonehouse, Glos. Nom. cap.: £3,000. Dir.: T. Voyce.

The Builder FUTURE CONSTRUCTION

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

MARCH 15.

***†Birmingham City C.**—Three shops and flats, Cross Farm-rd., Metchley Grange estate, Harborne. City A. Dep. £2 2s. Tenders by April 15.

†Enfield UDC.—Four shops with maisonettes over and 12 flats at High-st., Ponders End. F. Lee, MICE, 7, Little Park-gdns., Enfield. Dep. £2 2s. Tenders by April 6.

***†Enfield UDC.**—Four shops with maisonettes over and 12 flats, High-st., Ponders End. Frank Lee, E&S, 7, Little Park-gdns. Dep. £2 2s. Tenders by April 6.

MARCH 16.

***†Sutton and Cheam BC.**—16 dwellings adjoining The Rectory, Cheam. BE&S. Dep. £3 3s. Tenders by April 15.

MARCH 18.

***†West Riding CC.**—Extensions, Skelmanthorpe Sec. Mod. Sch. County A, "Bishopgarth," Westfield-rd., Wakefield. Dep. £1 1s. Tenders by April 18.

MARCH 19.

***†Essex Court of Quarter Sessions and Essex CC.**—Garage accommodation, Harlow Old Town police station; also stores, Chelmsford police headquarters. County A, Chelmsford.

MARCH 21.

***†Chislehurst and Sidcup UDC.**—27 garages, Imperial-way, Chislehurst, and 20 garages, Sidcup. E&S. Dep. £2 2s. each.

***†Essex CC.**—Erection of Basildon Kingswood Cty. Prim. Schs. County A, Chelmsford.

***Prescot UDC.**—Laying of sewers and erection of 50 houses, St. James estate. Gornall, Kelly & Ptnrs., architects, 155, The Albany, Old Hall-st., Liverpool, 3; or E&S. Dep. £2 2s.

MARCH 22.

***†Enfield UDC.**—22 garages, Holtwhites Hill estate. Frank Lee, E&S, 7, Little Park-gdns. Dep. £2 2s. Tenders by April 7.

MARCH 23.

Hambledon RDC.—12 houses and 16 flats at Elmside, Milford. E&S. Dep. £3 3s. Tenders by March 23.

MARCH 25.

***†Bucks CC.**—Infants sch., Castles estate, Bletchley. County A, Aylesbury. Dep. £2 2s. Tenders by April 18.

Lindsey CC.—Police house at West Keal, and four at Skegness. County A, Lincoln.

***†Tottenham BC.**—56 dwellings, Markfield redevelopment area, phase II. BE. Dep. £2.

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AGENTS FOR NAIRNS NEWHOUSE TILES

MARCH 26.

***†Beds CC.**—Ambulance depot, Leicester-rd., Luton. County A, Bedford.

Garforth UDC.—14 houses at Bagshaw site 13, Allerton Bywater. E&S. Dep. £2 2s.

***†Isle of Ely CC.**—School, Wisbech. County A, March. Dep. £5 5s. Tenders by May 7.

MARCH 28.

Bicester UDC.—2½ houses at North No. 1 estate, Buckingham-rd. H. W. Smith & Son, architects, 29, George-st., Oxford. Dep. £2 2s.

***Caernarvonshire EC.**—Extensions, Deganwy Sch. County A, Caernarvon. Dep. £2 2s.

***Halifax CBC.**—Small group home, Cousin-la. BE, Crossley-st. Dep. £2.

***Haslingden BC.**—21 houses and 4 flats, Broadway; and 9 houses and 16 flats, Town Ward. BS. Dep. £2 2s.

Newark RDC.—Four flats and 4 maisonettes at Balderton. W. Saunders & Ptnrs., architects, 24, Castle Gate.

Norton RDC.—Eight bungalows at Railway-st., Rillington. R. W. Clayton, architect, RDC Offices, Welham-rd., Norton, Malton. Dep. £2 2s.

***Slough BC.**—124 concrete garages. BE. Dep. £2 2s.

***Watford RDC.**—Three houses, Kendals-cl., Willow Way estate, Radlett. S. A. Nicholson, Clerk. Dep. £1 1s.

MARCH 31.

***Bexley BC.**—16 houses. N. Challen Clark & Ptnrs., surveyors, 18, Tooks-court, EC4. Dep. £2 2s.

***†Hampshire CC.**—New county offices adjoining Westgate, Winchester. Clerk, Winchester.

APRIL 1.

***Runcorn RDC.**—45 houses. E&S. Dep. £2 2s.

APRIL 4.

***Guildford RDC.**—28 dwellings, Tillingbourne-rd., Shalford. E&S. Dep. £2 2s.

***Lewes BC.**—Conversion of museum building, Albion-st., into library. BE&S. Dep. £2 2s.

APRIL 5.

***Brecon shire CC.**—Two classrooms, Ysgol-y-Graig Cty. Prim. Sch., Cefn Coed, near Merthyr Tydfil, Glam. County A, Brecon.

APRIL 8.

***West Riding Standing Joint Com.**—Police premises at Slaithwaite, Shepley, Appleton Roebuck and Ledston. County A, "Bishopgarth," Westfield-rd., Wakefield. Dep. £2 2s.

APRIL 9.

***Frome UDC.**—Reconditioning 9 and 10, Baker-st. S, Christchurch-st. West. Dep. £1 1s.

APRIL 11.

***Chester RDC.**—22 houses and 6 flats, Upton. T. C. R. Eaton (A), 16, White Friars. Dep. £3 3s.

APRIL 12.

***Brighton CBC.**—New sec. mixed gram. sch., Stanmer. BE&S, 26/30, King's-rd. Dep. £3 3s.

APRIL 16.

***Bucks CC.**—New cottage, etc., Pikes Farm, Haversham; same, Weedon Fields, Weedon-rd.; same, Buttermilkhall Farm, Oving. County Land Agent, Aylesbury. Dep. £2 2s.

APRIL 18.

***West Hartlepool CBC.**—Erection, Brierton Cty. Sec. Sch. Boro' A. Dep. £5. 5s.

NO DATE.

***Guildford BC.**—Additions, Municipal Offices. BE. Dep. £2 2s.

Scottish Special Housing Assoc.—44 houses at Falside, Bathgate. Scottish Special Housing Assoc., 15-21, Palmerston-pl., Edinburgh, 12.

PAINTING, ELECTRIC LIGHTING, MATERIALS, ETC.

MARCH 19.

Brierfield UDC.—S. (Materials.)

***†Durham CC.**—Concrete flooring and steel roof decking, Bishop Auckland Technical College, Workshop Block. County A, Durham.

MARCH 24.

***Harrow BC.**—External painting 668 dwellings. BE&S. Dep. £2 each (three contracts).

MARCH 28.

***LCC.**—Cleaning, repainting, etc., Chelsea and Wandsworth Bridges. Chief E. Dep. £1 each.

ROADS, SEWERAGE AND WATER WORKS

MARCH 15.

Newcastle-under-Lyme BC. — Making-up of Walleys-dr., Basford. BE&S. Dep. £2.

MARCH 17.

Southampton CBC.—Roads and sewers, stage 2, Millbrook Trading Estate. TC.

MARCH 18.

Leicester City C.—Private street works, contract No. 10, at Scraptoft (Thurnby) housing estate. City S. Dep. £1 1s.

MARCH 19.

Colchester BC.—Southern outfall sewer relief scheme. BE. Dep. £5.

MARCH 22.

Kingsclere and Whitchurch RDC.—Contract No. 8, Bishop's Green water supply scheme. Lemon and Blizard, engineers, 59, Tufton-st., Westminster, SW1. Dep. £3 3s.

Nidderdale RDC.—Water supply works at Whixley. W. K. Rodwell, AMICE, 29, High-st., Wetherby. Dep. £3 3s.

MARCH 23.

High Wycombe BC.—Road improvements in Kingsmead-rd. BE&S. Dep. £2 2s.

MARCH 24.

Lowestoft BC.—Roads and sewers at the Beeches estate. BE. Dep. £2 2s.

MARCH 26.

Bacup BC.—TC. (Materials.)

Lowestoft BC.—Construction of car park at Kirkley Cliff. BE. Dep. £1 1s.

MARCH 29.

Kettering RDC.—Main sewers and sewage disposal works at Loddington. Pick, Everard, Keay and Gimson, 6, Millstone-la., Leicester. Dep. £2 2s.

MARCH 31.

***Southend-on-Sea CBC.**—Tarmacadam roadway in Shoeburyness High Sch. grounds, Caulfield-rd., Shoeburyness. Boro' A, 30, Alexandra-st.

APRIL 4.

Martley RDC.—Contract No. 5, Part 1 of regional water supply scheme. Willcox, Raikes and Marshall, engineers, 33, Gt. Charles-st., Birmingham, 13. Dep. £10 10s.

NO DATE.

***Islington BC.**—Reconstruction of forecourts and carriageways, Wakelin House, N1. Housing Estates Manager, 220, Upper-st., N1.

GENERAL BUILDING WORK

(LONDON)

East Ham.—SPORTS PAVILION.—Approval has been given by MH&LG to the erection of a sports pavilion at Barrington-rd. playing field, at an est. cost of £7,000.

East Ham.—NURSERY SCHOOL.—Proposals have been approved by TC for the provision of a nursery school for 40 children at Wellstead-rd.

Friern Barnet.—MAISONETTES.—Proposals for the erection of a two-storey block of 10 maisonettes on land adjoining No. 253, Colney Hatch-la., N11, have been made by Catchpole & Co., Ltd.

Harrow.—CIVIC CENTRE.—TC are considering proposals for the development of about 15 acres at Poets' Corner, Wealdstone, as a site for a new civic centre.

Holborn.—CENTRAL LIBRARY.—Sketch plans are to be prepared by Boro' A for the erection of a central library at Nos. 32-38, Theobald's-rd.

Holborn.—OFFICES.—A 15-storey office building is to be erected in High Holborn, WC, on a 1¼-acre site, beneath which there will be basement garage space for 125 cars. The building, to be named State House, will be H-shaped on an island site bordered by Red Lion-st. and Sandland-st. Construction will begin this year and will be completed in 1958. The main front block, rising to 152 ft., is to be set well back from High Holborn and will be open to second-floor level through the use of reinforced concrete columns. A feature of the north block will be a bas-relief by Sir Jacob Epstein. The architects are Trehearne and Norman Preston & Ptnrs., 83, Kingsway, WC2.

Hornsey.—SCHOOL ADDITIONS.—The provision of additional accommodation at an estimated cost of £6,610 at Crouch End secondary school is recommended for TC's approval.

Kensington.—STORE'S EXTENSION.—Work is to be restarted on the proposed extension of the building of John Barker's store in Kensington High-st., at an estimated cost of over £1m. The scheme is expected to be completed in about 2½ years' time, and the project has been prepared by Mr. Bernard George, FRIBA, 34, Kensington-sq., Kensington, W8, staff architect to John Barker & Co.

Kensington. — COMPREHENSIVE SCHOOL. — Revised layout plans for the erection of the proposed Holland Park comprehensive school in the Campden Hill district, adjoining Cam House and Holly Lodge, for the LCC, have now been approved by TP Com. The scheme is being prepared by the schools section of the LCC architects' department.

Morden.—RECONSTRUCTION.—Schemes are being prepared by Ronald Ward & Ptnrs., architects, 29, Chesham-pl., Belgrave-sq., SW1, for the reconstruction of No. 62, London-rd., Morden, to form shop premises for Messrs. Noel & Co., Ltd.

Wandsworth.—HOUSING DEVELOPMENT.—Schemes have been prepared by P. V. Marchant, MICE, BE, S and A, Municipal-bldgs., SW18, for the development of the Portinscale-rd. housing site, and the Fairfield-st. No. 2 housing site, and quantities have been undertaken by his quantity surveying staff.

Wanstead and Woodford.—APPOINTMENTS.—The appointment of the following in connection with various conversion works is recommended for TC's approval: Thurgood, Son and Chidgey, quantity surveyors, 4, Broad-st.-bldgs., EC2, for the scheme at Nos. 27-29, Woodford-rd.; and Tooley and Foster, architects, Midland Bank-chbrs., Buckhurst Hill, for schemes at No. 28, Glengall-rd. and "Fairlawn," Vicarage-rd.

Wimbledon.—OLD PERSONS' BUNGALOWS.—BC are to build 22 bungalows for elderly couples, including six to be erected at the rear of Eagle House, fronting Lancaster-rd., at an estimated cost of £8,000. The other 16 are planned for the Queensmere-rd. estate.

(PROVINCIAL)

Altrincham.—Boddingtons Breweries, Ltd., propose erection of new hotel at Mainwood-rd. A, A. V. Booker, 28, Kennedy-st., Manchester.—Harland Engineering Co., Ltd., propose new offices at Harland-rd. A, Benjamin Waterhouse, 34, Deansgate, Manchester.—J. Maunders & Son, 554, Barton-rd., Stretford, propose erection of private housing estate at Weldon-rd. A, Matley, Brotherton & Mills, 29, Oxford-rd., Manchester.

Atcham.—RDC propose erection of 34 houses at Bayston Hill, 16 at Cressage, 20 at Westbury and 20 at Wroxeter.

Bebington.—Liverpool Reg. Hosp. Board preparing quantities for second phase of extensions at Clatterbridge Gen. Hosp. to provide radiotherapeutic facilities.

Blackwell.—RDC propose erection of 18 houses at Glapwell, 36 at Slade-la., Pinxton, and 74 at Thickley Bank, Shirebrook.

Blyth.—TC contemplating erection of two-storey flats with old people's or single persons' homes on ground floor in Delaval-ter. BE, D. W. Foster.

Bridgnorth.—TC to invite tenders for 86 houses at Grove site.

Brighouse.—BC to invite tenders from Alfred Robinson, Ltd., Brighouse; M. Harrison & Co. (Leeds), Ltd., Leeds; N. B. Bell & Co., Ltd., Leeds; Lister, Brook, Ltd., Brighouse; and Roland Lumb & Co., Ltd., Brighouse, for erection of 68 houses at Field-la. Estate.—W. & A. Thompson, Ltd., seek site on Wakefield-rd. Industrial Estate for new premises.—BC approved plans for club premises at Bradford-rd. for British Legion Club, Ltd.; eight houses at Dewsbury-rd., Rastrick, for Thornhill Yorkshire Estates Co.; six houses at Slade-la., Rastrick, for L. Hargreaves.

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Bury.—Middleton & Co. (Blackpool), Ltd., propose erection of 38 semi-detached houses at junction Manchester-rd./Dumers-la.

Carlisle.—EC's 1956-7 building programme expected to comprise Harraby Sec. Sch. (£103,000), Carlisle and Cty. High Sch. for Girls (extension) (£26,000); educationally sub-normal children's sch. (£35,000); Morton Inf. Sch. (£39,000); and College of Art (additions), £50,000.

Chester.—Cheshire CC received approval in principle for erection of annexe to proposed new County Offices, £55,000 est.

Chesterfield.—RDC propose following houses in 1955: 55 at Beighton, 30 at Hackenthorpe, 49 at Brimington, 20 at Sutton-cum-Duckmanton, five at Eckington, 24 at Ridgeway and Marsh-la., 34 at Gleadless, eight at Shirland and Higham, eight at Holmesfield and 29 at Unstone. Plans by E&S.—Approved plans for 10 houses at Little Morton-rd., North Wingfield, and 10 at Station New-rd., Tupton, for John Adlington, Ltd.

Consett (Co. Durham).—New RC church to be built. A, Anthony Rossi, Consett.

Coventry.—Watch Com. propose that police housing schemes at Alfred-rd., Willenhall Neighbourhood Unit and Bell Green Neighbourhood Unit (No. 4) be proceeded with and that application be made for sanction to loan £24,198 in respect of cost.—Libraries and Museum Com. recommend that erection of Herbert Art Gallery and Museum be proceeded with and that application be made for sanction to lean £216,068.—Educ. Com. recommend that application be made for approval of expenditure amounting to £42,650 for provision of nursery units at Aldermoor Farm, Parkgate, and Whitmore Park schools.

Denton.—St. John Ambulance Brigade (secretary, Miss E. Lennie, 10, Acre-st., Denton), propose erection of new headquarters at Ashton-rd.

Derby.—Strettons Brewery Co., Ltd., propose erection of licensed premises at Henley Green, Mackworth.—Sheffield Reg. Hosp. Board appointed Naylor, Sale & Widdows, St. Mary's-chbrs., St. Mary's Gate, Derby, as architects for two-storey connecting corridor to hosp. ward block at Manor Hosp.—EC to invite tenders this year for erection of Breadsall Hill Top Sec. Tech. Sch.

Durham.—CC instructed County A, G. R. Clayton, to prepare final plans for proposed County Offices and to engage consultants.

Durham.—CC to erect aged persons' hostels at Consett (£38,500) and Chester-le-Street (£39,500). County A, G. R. Clayton, Court-la., Durham.

Durham.—CC to build ambulance depot at Seaham and Hartlepool.—Health centres proposed at Peterlee, Newton Aycliffe and Billingham.—County Children's Com. to spend £107,500 on construction of 25 family group homes.—Home Office approved erection of admin. block at new fire brigade headquarters in 1955-56 building programme of CC.—Proposed fire station at Spennymoor expected to be included in next year's building programme.—County A, G. R. Clayton, to design system of light construction to allow competitive tenders for frame, principal members and cladding to be obtained.—Following architects for school schemes appointed: R. Brown, Crown-st. Chambers, Darlington, Barnard Castle Mod. Sch.; S. W. Milburn & Ptnrs., 9, Esplanade, Sunderland, Peterlee Mod. Sch.; and P. R. Middleton, 17, Albert-rd., Middlesbrough, Hartlepool West View Mod. Sch. QS appointed as follow: Davis & Ptnrs., 28, Osborne-rd., Newcastle, Horden New Spec. Sch.; Turner and Ing, 2, Garden-st., Darlington, Bowburn Mod. Sch. and Billingham Mod. Sch.; and R. H. Duns, Osborne-rd., Newcastle, Spennymoor Grammar Tech. Sch.

Essex.—County Finance Com. have submitted following estimates for new liabilities: Braintree County High Sch. (extensions), £30,000; erection of Harlow Potter-st. County Sec./Tech. Sch., £274,982; kitchen and dining-room at Romford St. Edward's (Aided) Sec. Sch., £12,000; erection of temporary emergency accommodation in Netteswell area, Harlow New Town County Prim. Sch., £50,336. Minor capital projects, 1955/56: Primary and sec. schs., £301,000; further education, £60,000.

Felling (Co. Durham).—Plans approved for proposed canteen in Stoneygate-la. for International Paints, Ltd. Plans by firm's own staff. UDC received Ministry sanction to erect 216 houses by direct labour, cost £297,634.

Felling (Co. Durham).—UDC negotiating with Wimpey & Co., Ltd., Orchard House, Newcastle, and John Clark & Son, Seaham, for erection of further houses on Leam-la. housing estate.

Halesowen.—TC approved plans: Site for iron and steel merchant's yard at Park-la., Cradley, and premises at Factory Centre, Maypole Fields, Cradley, for W. & G. Electric Welding Co., Ltd.; extensions at Excelsior Works, Mucklow Hill, for Railway Accessories, Ltd.; office extensions at Long-la., Cakemore, for Alfred Wright & Sons; extensions to offices at Mucklow Hill for Halesowen Steel Co., Ltd.; licensed premises at junction Meres-rd./Compton-gr. for Frederick Smith, Ltd.

Harrogate.—TC approved plans for erection of four-storey office block at Raglan-st. for Lime Sand Mortar, Ltd.

Lancs.—CC propose adaptation of premises at Gloucester-rd., Birkdale, to form hostel for aged, £27,386 est.

Leamington Spa.—Work is due to begin at Southam in October on £118,500 school to be erected on site adjoining windmill, north of Old Welsh-rd. To be finished in 18 months, it is designed by County A, G. R. Barnsley, and will be 12-class instalment of future four-form sec. mod. sch. Present instalment will accommodate 360 children, and include practical rooms, library and assembly hall in pre-cast concrete.

Liverpool.—TC approved plans for extensions to Unit Factory No. 5 on Fleming-rd. site, Wootton, for Automatic Telephone Co., Ltd. Plans by City A, Dr. Ronald Bradbury, Blackburn-chbrs., Dale-st., Liverpool.—Liverpool City Rugby Football Club propose new stand and extensions to existing stand and pavilion at East Prescot-rd. Architect, Walter Lewis, 34, Castle-st., Liverpool.

Liverpool.—City Council approved building programme by the Ed. Com. for the coming year, at total cost of £2m.

Manchester.—TC propose adaptations of Ely House, North-rd. and Church-la., Newton Heath, to form aged persons' club; erection of offices, stores and garages for Waterworks Com. at Ladybarn-rd., Fallowfield; propose erection of branch library at corner Portway/Stone-acre-rd., Woodhouse Park; erection of nine single-storey aged persons' dwellings at rear of Parrs Wood-rd., First and Second-aves. and The Drive, Withington.—Phœnix Photo Engraving Co., Ltd., propose erection of three-storey works and offices on vacant site adjoining 73, Ellesmere-st. and 76, Cawdor-st., Hulme. A, J. Price Nunn & Quysner, 180, Oxford-rd., Manchester.

Manchester.—Manchester Chemical Co., Ltd., Gibbon-st., Bradford, propose erection of building for storage of food products. Planning application permission submitted by H. H. Fuller Peiser & Co., 16, Farringdon-st., London, EC4.—Lycett & Platt, Ltd., 161, Plymouth-gr., Chorlton-on-Medlock, propose two-storey extension to their workshop and offices.

Morpeth.—RDC approved erecting of 40 aged people's bungalows this year. Plans by S, J. K. Miles, Dacre House.

Nantwich.—UDC propose extensions to Civic Hall, £11,476 est.

Newcastle-on-Tyne.—City C. received Govt. sanction to acquire 280 acres of land at Newbiggin Hall and Westerhope to provide space for 3,000 houses, schools and other facilities, est. cost nearly £4m.—Co-op. Society to build branch premises in Benton-rd. Plans by A Dept., CWS, 90, Westmoreland-rd.

Newcastle-on-Tyne.—Factory additions proposed in Hunters-rd. for Presco, Ltd., and firm have prepared own plans.—J. M. Angus, 21, Lovaine-pl., Newcastle, architect for club additions, including steward's flat, in Raby-st., for St. Peter's Social Club.—Alterations proposed in Blandford-st. for Freeborns, Ltd., architects, Arthur and Kirkcup, 13, Swinburne-st., Gateshead.—Vaux and Assoc. Breweries, Ltd., Sunderland, to rebuild "Locomotive Inn" to plans by E. M. Lawson, Barras-bldgs., Barras Bridge, Newcastle.—Tinsmiths' and blacksmiths' shops to be erected at Neptune Shipyard of Swan Hunter and Wigham Richardson, Ltd. Plans by T. F. Burns & Ptnrs., Ellison-pl., Newcastle.—R. W. Bell & Co., Ltd., contractors, Mistletoe-rd., Newcastle, plan erection of multi-storey block of business premises, cost about £200,000, in New Bridge-st.

Northampton.—City & Town Buildings, Ltd., Bournemouth, propose erection of three-storey block of shops and offices at Abington-st. Architects, L. H. Fewster & Ptnrs., 22, Conduit-st., London, W1.

Oldham.—EC propose new sec. mod. sch. at Fitton Hill.

Otley.—West Riding CC propose erection of seven police houses at Bradford-rd. Plans by County A, H. Bennett, Wakefield.

Penrith.—UDC to invite tenders for erection of aged persons' dwellings at Elm-terr.

Preston.—TC approved in principle construction of new bus station between Tithe Barn-st. and North-rd.

Ramsbottom.—UDC inviting tenders for further 68 dwellings at Tagg Wood Estate.

Ryton (Co. Durham).—Pithead baths proposed at Phœnix Drift. NCB Architects' Dept., Ashfield Towers, Gosforth, Northumberland.

Scarborough.—North Riding EC seek Min. approval for inclusion of first instalment of new technical college in 1956 programme, £120,000 est.—Swifts and Boothbys Batteries, Ltd., propose erection of new factories at Eastfield.

Seaton Valley.—UDC seek loan sanction £30,434 for erection of houses in Village-rd. and Seghill Station, and laying of Murton Grange sewer. S, T. W. Burgess.

Shardlow.—RDC propose 30 houses at Shelton Lock, 20 at Chellaston, 12 at Breadsall, 14 at Little Eaton, 10 at Littleover, 22 at Sandiacre, 30 at Spondon, four at Western-on-Trent, 50 at Barrowash, and eight maisonettes at Shardlow.

Shipley.—UDC propose erection of four shops at Coach-rd. and Thompson-la.

South Shields.—BE. John Reid, prepared £36,000 scheme for extending Transport Depot and plan being submitted to MoT for consideration.—Plans by Page, Son and Hill, 75, King-st., South Shields, for additions to Mortimer-rd. Cty. Inf. Sch. and Simonside Cty. Jn. Mixed Sch. approved.—TC recommended to erect factory in Waterloo Vale area, cost £21,000, to be let to Denton & Co., asbestos and india rubber merchants.—Ravenseft Properties, Ltd., London, considering erection of three-storey block of offices and shops on north side of South Shields Market. Firm's A, Fewster & Ptnrs., 22, Conduit-st., London, W1.

Stockport.—EC appointed H. C. Stott & Co., 38, King-st. West, Manchester, as QS for proposed Brinnington No. 2 Cty. Prim. Sch.—Approved plans: Two-storey extension at Carrington-rd. for J. Needham & Sons, Ltd.; church hall at junction of Edgeley-rd. and Cheadle Old-rd. for Edgeley-rd. Congregational Church.

Stockton-on-Tees.—J. W. Henderson & Co., Ltd., builders, to erect 43 houses near Junction Farm, Egglescliffe.—G. P. Stainsby, 67, High-st., architect for garage and offices in Portrack-la. for H. Peacock, Ltd., transporters.

Sunderland.—TC to build 124 garages on housing estates at £24,750.

Sunderland.—TC including in estimates £264,000 for proposed abattoir at Fulwell. Boro' A, H. C. Bishop, Grange House, Stockton-rd. QS, T. H. Rae, 5, Belford-ter.

Uttoxeter.—RDC propose erection of 50 houses for civilian personnel at Sudbury Military Camp.—UDC propose erection of 30 houses at Byrds-la. and four at New-rd.

Walsall.—TC to prepare quantities for new branch library at Elmore-row, Bloxwich.—Walsall & District Co-op. Society, Ltd., propose erection of new shop premises at junction Dartmouth-ave./Coalpool-la. A, E. H. Appleton, 53, Bradford-st., Walsall; to sell site at junction Rowland-st./Bentley-la. for A. E. & F Britain, Ltd. for erection of new showroom, store and workshop.

Wallsend.—Tenders to be obtained by TC for proposed additions to Wallsend Civic Hall. A, R. Burke, Lambton House, Lambton-rd., Newcastle-on-Tyne.—Approval given to outline scheme for factory on Coast-rd. for G. Angus & Co., Ltd., Westgate-rd., Newcastle-on-Tyne.—P. L. Browne, Son & Harding, Pearl-bldgs., Northumberland-st., Newcastle, architects for proposed rebuilding of "Engine Inn," Willington Quay, for W. B. Reid & Co., Ltd.

Warwickshire.—EC to include following schools in 1955-56 programme, subject to Min. approval: Kineton Cty. Sec., Henley-in-Arden Cty. Sec., Balsall Common Heart of England Cty. Sec., completion of Atherston Cty. Sec., Solihull Arden Edge Cty. Sec., Lamington Dormer RC Sec., and Kenilworth South Cty. Sec.

West Riding.—EC to include following schools in 1955-56 programme: Thurcroft inf., £45,000 est.; Thurcroft jun., £56,000 est.; Cudworth Snydale-rd., £45,000 est.; Bawtry, £35,000 est.; Morley Wide-la., £50,000 est.; Barnburgh jun. mixed and inf., £35,000 est.; Sowerby Bridge Newland, £71,354 est.; sec. schools at Sowerby Bridge, £210,000 est.; Holmfirth, £160,000 est.; Elland, £155,000 est.; Dinnington, £175,000 est.; and Settle, £100,000 est.—CC propose new fire station at Skelmanthorpe, £12,198 est.

Whaley Bridge.—UDC to erect 31 houses and bungalows at Taxal and four bungalows at Jodrell Meadow in 1955 programme.

Whitley Bay.—Plans prepared by S. H. Lawson, FRIBA, Emerson-chbrs., Blackett-st., Newcastle-on-Tyne, for erection of PH in Earsdon-rd., Monkseaton, for Bass, Rafcliffe and Gretton, Ltd.

Workington.—BC approved plans: Single-storey building for use as food warehouse at Irving-st. for Workington Dist. Industrial & Prov. Society, Ltd. Plans by CWS Architects, 90, Westmorland-rd., Newcastle-on-Tyne; erection of shops and offices at Murray-rd. for Timothy White & Taylors, Ltd., Burley Hill, Leeds, 4. Plans by Staff A, L. G. Booth; shops and offices at Oxford-st. for C. W. Murray. A, J. Saul, National Provincial Bank-chbrs., Workington.

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‡ Denotes *recommended for acceptance*.
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¶ Denotes *accepted by H.M. Government Departments*.

Aberdeen.—Reconstruction scheme at 451 to 461, George-st. Architects, Tawse & Allan, F.FRIBA, 9, Bon Accord-cres. (Union-st.), Aberdeen. Excavation, brick, building and allied works: George Hall, Ltd., 17, Back Hilton-rd. Plumbing, sanitary engineering: R. V. Pirie & Hunter, Ltd., 9, Dunbar-st. Joinery, carpentry, ironmongery: Henry & Keith, Ltd., 21, Gilcolmston Park, Westend. Steel structural engineering works: George Cassio & Sons, Ltd., 600, King-st. Painting, decorating: Robert Park, 21, Ashvale-pl. All Aberdeen contractors.

Altrincham.—Storage bay and spraying shop, Atlantic-st., for Churchhill Machine Tool Co., Ltd.: *Wm. Thorpe & Sons, Ltd., Stretford-rd., Manchester.

Andover.—21 houses, Leigh-rd. site, for BC: Sturgess Bros., Andover, £29,409.

Atherton.—Additional 84 houses at Hag Fold Estate, for UDC: *G. & J. Seddon, Ltd., Little Hulton, nr. Bolton, £113,448.

Birmingham.—Erection of following schools, for EC: Lordswood Boys' Technical, *G. Wimpey & Co., Ltd,. London, £275,277; Handsworth Boys' Technical, *James Miller & Partners., Ltd., Spring Vale, Birmingham, £208,903; Amblecote-ave. Special School, *Joseph Webb & Co., Ltd., Ivy House-la., Sedgeley, £64,439; phase 2, Sheldon Comprehensive, *C. Bryant & Son, Ltd., 65, Whitmore-la., Birmingham, £65,233; Collingwood Special, *James Miller & Partners, Ltd., £63,499; Frisby-rd. Nursery Unit, *F. Deeley, Ltd., 210, High-st., Harborne, £17,699.

Bletchley.—Nine pairs of bungalows and one pair of houses, for UDC. J. F. Smithie, E&S: *Drabble Construction, Ltd., Bletchley, £21,168.

Bradford.—Shops and offices at corner of Bank-st. and Broadway, for S. H. Chippendale & Co., 5, Charles-st., Bradford: *Sir Robert McAlpine & Sons, Ltd., 80, Park-la., W1.

Bury.—Outpatients' dept. at Bury General Hospital, for Manchester Reg. Hospital Brd. Architects, Pierce & Son, St. Petersgate, Stockport, Ches.: *Thompson & Brierley, Ltd., Bury.

Canterbury.—Erection of omnibus station between St. George's-la. and St. George's-terr., for the East Kent Road Car Co., Ltd. Architects, H. Campbell Ashenden & John Clark (F & LRIBA). Quantity surveyor, Joycelyn R. Douglas, Tankerton: *Richard Costain, Ltd. (cost about £70,000).

Cheshunt.—16 dwellings, Brookfield-la., for UDC. C. Culpin & Ptnr., architects, 3, Southampton-pl., WC1. Quantities by Dearle & Henderson: *George Mott & Son, Watton-at-Stone, Hertford, £15,585.

Coventry.—Shops, flats and garages at Quinton-rd., for Alfred Robinson (Builders), Ltd.: *Direct Labour.

Crewe.—170 houses at Wistaston Green Estate, for TC: *Direct Labour, £224,676

Feltham.—Ship tank for National Physical Laboratory at Fagg's-rd.: *Sir Robert McAlpine & Sons, Ltd. (cost about £2m.).

Glasgow.—Additions for George Hopkinson Organisation, Ltd., 23, Mitchell-st., C1, at junction of Argyll and Dunlop-st. Architects, Wylie, Shanks & Wylie, F.ARIBA, 12, Claremont-gdns., Charing Cross, Glasgow, WC3. Demolition, steel construction, brick and building: Robert & Son, Ltd., Barrland-st., Maxwell-rd., Pollockshields, Glasgow, SS1. Joinery, carpentry, ironmongery: Colin Hunter & Co., Ltd., 170, Great Western-rd., St. George's Cross. Glazing: Thomas Galt, 45, Buchan-st., Gorbals. Heating engineering installation: James Coombes, Ltd., 103, Hanover-st., City.

Glasgow.—Additions for Arc Manufacturing Co., Ltd., Artarc Works, Nitshill, at Nitshill-rd.: *Hugh Leggat & Co., Ltd., 9, Gladstone-ave., Barrhead, Renfrewshire.

Howden.—20 houses, Derwent estate, for RDC. Architect, G. L. Thompson, FRIBA, Clifton-chbrs., Park-st., Selby. Quantities, Ullathorne & Dunling, Hull.

Samuel Owst & Son, Ltd., Hull	£29,766
Squire W. Swift, Ltd., Selby	29,664
F. Shepherd & Son, Ltd., York	27,868
Stepney Contractors, Beverley	26,000
Derek Webster, Doncaster	25,293
Bainbridge (Blds.), Ltd., Doncaster ..	25,016
*T. R. Barnett, Ltd., Hull	24,389

Ilkeston.—Erection of following houses at Kirk Hallam Estate, for BC: (39) *F. Sisson & Sons, Ltd., 32, Cromford-rd., Langley Mill, £49,085; (16) *E. & S. Halford, Ltd., Park-rd., Ilkeston, £20,260.

Kensington.—Erection of 6 flats on sites of 53, 55 and 57, Faraday-rd., 5 flats on sites of 275 and 277, Ladbroke-gr., and 4 flats on site of 297, Ladbroke-gr., for BC: *Prestige & Co., Ltd., £32,572.

Leeds.—Large extensions to physical and chemistry laboratories at the University, for the Senate: *J. Gerrard & Sons, Ltd., Swinton, nr. Manchester.

Liverpool.—Works for City Council: Erection of Speke (Central) branch library: *The Unit Construction Co., Ltd., Speke Boulevard, Speke, Liverpool, 19, £30,445; erection of additional floors at Clayton-st., bookstacks: *William Moss & Sons, Ltd., 4, Roscoe-st., Liverpool, 1, £16,325.

Liverpool.—Large extensions for Horsemaster Machine Co., Ltd.: *Wm. Tomkinson & Sons, Ltd., Liverpool.

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¶London (Metropolitan Police).—Erection of 7 flats, 214/218, Peckham Rye: *M. J. Deane & Co., Ltd., £18,769.

¶London (MoW).—Contracts placed by MoW for week ended February 26:—

Berkshire: ARC Experimental Field Station, Compton, erection of a special laboratory, W. E. Chivers & Sons, Ltd., Devizes, Wilts. MOS Housing Site, Burghfield, erection of 62 houses and external works, W. E. Chivers & Sons, Ltd., Devizes, Wilts. *Buckinghamshire*: Bletchley Park, Bletchley, adaptations to form cinema at Post Office Training School, A. G. Morgan, Ltd., 8, High-st., Olney, Bucks. *Lancashire*: Post Office, Kingsgate Institute, Bolton, alterations and adaptations, R. J. Tyson, Ltd., Wellington Saw Mills, Great Lever, Bolton. *London*: GPO, 18/20, Crucifix-la., SE1, adaptations for Post Office laboratory, George Moss & Sons, Ltd., Cranleigh Wharf, Lady Margaret-rd., Southall, Middx. COI, 184/192, Bermondsey-st., SE1, new works and alterations, Whyatt (Bldrs.), Ltd., 225, Streatham High-rd., SW16. British Museum, WC1, reconstruction of Greek and Roman lift room and coins and medals gallery (phase 1), John Mowlem & Co., Ltd., 91, Ebury Bridge-rd., SW1. *Middlesex*: RN Range, Wembley, erection of messing and recreational accommodation, Richard Costain, Ltd., 4, Princess-pl., Notts-st., Plymouth. *Norfolk*: Norwich, erection of a sorting office and garage, J. Youngs & Son, Ltd., City-rd. Works, Norwich. *Stirlingshire*: HM Customs and Excise, Grange Dock, Grangemouth, alterations and extensions, Alex Williamson & Son, Grange Joinery Works, Grangemouth. *Suffolk*: Post Office, Church-st., Hadleigh, major alterations, W. B. Kingsbury & Sons, Ltd., Commerce House, Boxford, Colchester, Essex.

¶London (War Dept.).—Contracts placed by War Dept. for week ended February 25.

Berkshire: Roadwork, Boshers (Cholsey), Cholsey. *Cheshire*: Electrical installation, F. H. Wheeler & Co., Ltd., Manchester. *Hampshire*: Roof repairs, James Geo. Tuxford, London. *Kent*: Building work, J. J. Clayson & Son, Ltd., Folkestone. *Lancashire*: Water supply (concrete wells), John McGeoch & Sons, Kirkby. *Northumberland*: Painting, W. C. Simpson & Son, Ltd., Edinburgh. *Nottinghamshire*: Building work, Adam Eastwood & Sons, Ltd., Mansfield. *Pembrokeshire*: Concrete hardstanding, Hussey, Egan & Pickmere, Ltd., Pembroke. *Yorkshire*: Painting and decorating, F. Labbett & Sons, Ltd., Nottingham; building work, F. Shepherd & Son, Ltd., York.

Manchester.—Following for EC: Science block at North Manchester Grammar School, *Alfred Hodkinson, Ltd., Manchester; Irwell College of Further Education, *Robert Carlyle & Co., Ltd., Elsinore-rd., Trafford Park, Manchester; Broad Oak Prim. Sch., East Didsbury, *G. & J. Seddon, Ltd., Little Hulton, nr. Bolton.

Manchester.—Extensions to canteen at Moston Works, for Ferranti, Ltd.: *Moston Brick & Building Co., Ltd., Kenyon-la., Collyhurst, Manchester.—New transport depot at Lloyd-st., for Nathan Fine, Ltd.: *Contractors (Manchester), Ltd., Greg-st., Reddish, Stockport.

Manchester.—300 houses, maisonettes and cottage flats at Peel Hall, Withenshawe, and 10 maisonettes and flats at Langley Estate, Middleton, for TC: *Direct Labour.

Newcastle-on-Tyne.—North Kenton Prim. Sch. for EC. City A, George Kenyon, 18, Cloth Market, Newcastle. Quantity surveyors, Connell & Son, 25, New Bridge-st., Newcastle. Electrical consultants, Gregory & Pnrs., Pilgrim House, Newcastle: *Holland, Hannen and Cubitts, Ltd., Howdon-on-Tyne, £93,931.

Oldham.—Alterations and adaptations at 60, Huddersfield-rd. and at Ebenezer-bldgs., for MOW: *Haldean Building Co., Ltd., Booth-st., Middleton.

Peterhead.—Factory at Greenhill site for Herring Industries Board, 1, Glenfaulds-st., Edinburgh. Architect, Mr. W. Preston, Commissioners' Chief Engineer, 13, Beeches-ave., Carshalton Beeches, Surrey: *William G. Cooper, Ltd., Longate Contracting Works, Peterhead.

Rochdale.—Erection of shopping centre at Kirkholt estate for CB: *G. Wimpey & Co., Ltd., £89,575.

Rugby.—34 houses on various sites, for RDC: *Trusteel Co., Ltd., Watford, £50,391.

Sedgefield.—48 houses at Ferryhill for RDC: *Direct labour.

Stone.—14 houses at Moss Gate, for RDC: *M. A. Boswell (Contractors), Ltd., School-st., Wolverhampton, £22,476.

Stretford.—Works for TC: Erection of 8 flats at Stretford-rd., Urmston: *D. Franklyn, Urmston, £10,512.

Sunderland.—Works of Corporation: Erection of Castle View Cty. Prim. Jun. Boys' and Girls' Schs. at Hylton Castle estate: *W. D. & R. Allison & Sons, Whitburn, £96,461 (subject to approval); site preparation works at Hylton Red House estate: *Yorkshire Builders, Ltd., Cleckheaton, Yorks, £191,299.

Swinton and Pendlebury.—40 houses at Clifton Neighbourhood Unit, for TC: *Direct Labour, £56,187.

Wallsend.—Factory additions, North-ter., for Victor Products, Ltd., mining equipment manufacturers: *Direct labour.

Wednesbury.—20 houses at Millfields Estate, for TC: *S. J. Smith & Co. (Bidford), Ltd., Smith-rd., Wednesbury, £30,648.

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